

United States International Trade Commission

Oil and Gas Field Services:

Impediments to Trade and Prospects for Liberalization

Investigation No. 332-444
USITC Publication 3582
March 2003



U.S. International Trade Commission

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Oil and Gas Field Services: Impediments to Trade and Prospects for Liberalization

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ABSTRACT

Following receipt on June 18, 2002, of a request from the United States Trade Representative (USTR) (see appendix A), the U.S. International Trade Commission (USITC) instituted investigation No. 332-444, *Oil and Gas Field Services: Impediments to Trade and Prospects for Liberalization*, under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)). As requested by USTR, this report provides (1) a description of the various activities involved in oil and gas field services; (2) a discussion of the nature of trade in oil and gas field services; and (3) an examination of the extent of impediments to trade and the potential benefits of trade liberalization. For the purpose of the study, USTR defined the oil and gas field services industry to include exploration and evaluation activities; drilling activities; and well development and completion activities. Since oil and gas field services are conducted in a large number of countries, the Commission was requested to focus on issues that are relevant multilaterally. Copies of the notice of the investigation were posted in the Office of the Secretary, U.S. International Trade Commission, Washington, DC 20436, and the notice was published in the *Federal Register* (Vol. 67, No. 135) on July 15, 2002 (see appendix B). In addition, interested parties were invited to submit written statements concerning the investigation by October 22, 2002.

In its examination, the Commission found that the most significant impediments to trade in oil and gas field services include poor transparency, specific labor requirements, joint-venture requirements, limitations on foreign investment, and technology transfer requirements. To some degree, each of these impediments is addressed by the trade disciplines contained in the General Agreement on Trade in Services (GATS) which, with an active round of negotiations presently underway, may offer an immediate avenue for pursuing liberalization. A review of existing commitments under the GATS relating to oil and gas field services indicates that relatively few countries have made specific commitments, and the actual commitments that have been made generally are limited in scope.

Although the Commission was unable to quantify the benefits of liberalization in this sector, improvements in transparency and the elimination of discriminatory practices likely will yield the traditional benefits of trade liberalization. These include the gains that accrue to countries that specialize in the goods and services for which they have a comparative advantage; downstream benefits that accrue to both petroleum producers and consumers as a result of decreased extraction costs; and the benefits derived from knowledge spillovers that ultimately reduce overall industry costs.

CONTENTS

	<i>Page</i>
Abstract	i
Executive summary	vii
Glossary of terms	xi
Chapter 1: Introduction	1-1
Objective and scope	1-1
Background information	1-1
Approach and data sources	1-2
Organization of the report	1-3
Chapter 2: Description of oil and gas field services	2-1
Exploration and evaluation	2-1
Drilling	2-3
Vertical drilling	2-3
Directional drilling	2-4
Offshore drilling	2-5
Logging and recording	2-6
Development and completion	2-6
Extraction	2-7
Chapter 3: Nature of trade in oil and gas field services ...	3-1
Field service providers	3-1
Field service consumers	3-2
Field services market	3-8
Nature and extent of trade	3-13

CONTENTS--Continued

	<i>Page</i>
Chapter 4: Extent of impediments to trade and potential benefits of liberalization	4-1
Extent of impediments to trade	4-1
Transparency	4-1
Labor requirements	4-2
Joint-venture requirements and investment limitations	4-2
Technology transfer requirements	4-2
Movement of equipment issues	4-3
Trade sanctions	4-3
Other impediments	4-4
Potential benefits of trade liberalization	4-4
Gains through comparative advantage in oil and gas field services	4-5
Impact of liberalization in oil and gas field services on downstream markets	4-5
Potential gains from technological spillovers	4-6
Effects on overall industry competition	4-7
Trade-offs of trade impediments	4-7

Chapter 5: Potential for liberalization of oil and gas field services under the GATS	5-1
---------------------------------------------------------------------------------------------------	-----

Chapter 6: Conclusion	6-1
------------------------------------	-----

Appendixes

A. Request letter	A-1
B. Federal Register notices	B-1
C. GATS commitments on oil and gas field services by country	C-1
D. Energy services coalition membership list	D-1

Boxes

3-1. Contracting process for oil and gas field services	3-10
3-2. Recent policy developments in selected markets	3-11

CONTENTS--*Continued*

Page

Figures

2-1.	Exploration and well development	2-2
3-1.	Overview of the oil and gas field services contracting process	3-3

Tables

3-1.	Overview of major oil-producing countries: Selected market characteristics, 2001	3-4
3-2.	Overview of major natural gas-producing countries: Selected market characteristics, 2001	3-6
3-3.	World's largest oil companies, 2001	3-9
3-4.	Oil and gas field services: Sales by foreign affiliates of U.S. companies by country, 1998	3-15
5-1.	Selected GATS provisions	5-3
5-2.	Examples of energy services contained in selected headings of the services sectoral classification list, which is used in scheduling commitments under the General Agreement on Trade in Services	5-6
5-3.	Summary of Uruguay Round market access and national treatment commitments for sectors most relevant to oil and gas field services	5-7

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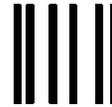
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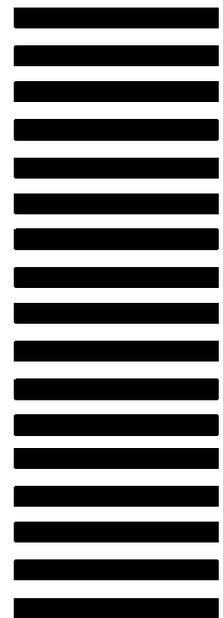
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EXECUTIVE SUMMARY

Introduction

- Following receipt on June 18, 2002, of a request from the United States Trade Representative (USTR) (see appendix A), the U.S. International Trade Commission (USITC) instituted investigation No. 332-444, *Oil and Gas Field Services: Impediments to Trade and Prospects for Liberalization*, under section 332(g) of Tariff Act of 1930 (19 U.S.C. 1332(g)). As requested by USTR, this report provides (1) a description of the various activities involved in oil and gas field services; (2) a discussion of the nature of trade in oil and gas field services; and (3) an examination of the extent of impediments to trade and the potential benefits of trade liberalization. For the purpose of the study, USTR defined the oil and gas field services industry to include exploration and evaluation activities; drilling activities; and well development and completion activities. Since oil and gas field services are conducted in a large number of countries, the Commission was requested to focus on issues that are relevant multilaterally.
- The current study is the third in a series of investigations of the energy services sector requested by USTR. The Commission published reports on electric power services and natural gas services, respectively, in November 2000 and October 2001.

Oil and Gas Field Services Description

- Oil and gas field services related to the development of oil and natural gas resources may be divided into two categories: drilling and support activities. Drilling services include the supply of land and sea rigs, other specialized equipment, and expertise to oil and gas producers on a contract basis. Support activities include various services, such as seismic imaging and analysis, used in the exploration and evaluation of potential wells; wireline services like measurement-while-drilling which supports the drilling activity itself; and artificial lift and stimulation services, which aid in the recovery of oil and gas after the well has been drilled.
- Technological advances have broadened service offerings by oil and gas field services providers and improved industry efficiency. For example, the use of computer technology to create two-, three-, and four-dimensional images of oil and gas reservoirs increases the likelihood of success in finding oil and gas, and horizontal, or directional, drilling, whereby the drill bit can be turned to run parallel to the surface, increases the amount of retrievable oil from a single well. In the offshore drilling segment, new technologies have enabled wells to be drilled in increasingly deep water. Two important new technologies are drill ships and floating, production, storage and offloading (FPSO) vessels. Drill ships are able to drill wells in water up to 10,000 feet deep. FPSO vessels are

specialized vessels anchored to the ocean floor that extract oil and gas, provide temporary storage, and offload production to be transported to final destinations.

The Nature of Trade

- The oil and gas field services industry is composed of two tiers of firms: large, integrated companies with competence in a broad range of activities; and small- and medium-sized firms that perform specialized activities. Although large firms have a distinct competitive advantage in the provision of services that are highly capital-intensive, there remain considerable opportunities for small- and medium-sized enterprises to provide services. For example, geological, geophysical, and other prospecting services can be provided by relatively small specialized firms. In addition, onshore drilling and certain other support activities can be performed by smaller firms with specialized expertise.
- The primary consumers of oil and gas field services are exploration and production (E&P) companies, which include large integrated companies like ExxonMobil and state-owned enterprises like Petróleos de Venezuela. These companies hold or acquire the right to explore for and produce oil and gas within a designated region. Recent changes in government policy have encouraged greater private-sector participation in the E&P segment while retaining clear state control over the management of natural resources. In exchange for the rights to market the resource, private companies provide all investment capital and compensate the government with royalties and taxes from the sale of oil and gas. By increasing the number of private companies engaged in production, these policy reforms have helped to expand the overall market for oil and gas field services.
- Although the global market for oil and gas field services is estimated to be on the order of \$100 billion, trade data generally are unavailable. However, U.S. data on the operations of multinational enterprises did report sales of oil and gas field services through majority-owned foreign affiliates up until 1998. According to these data, foreign affiliates of U.S. firms recorded sales of oil and gas field services measuring \$8.6 billion in 1998, with Europe and Latin America as the largest markets.

Impediments to Trade and Potential Benefits of Liberalization

- Impediments to trade in oil and gas field services most frequently encountered by international oil and gas field service providers include poor transparency, specific labor requirements, joint-venture requirements, limitations on foreign investment, and technology transfer requirements. Examples of these impediments can be found in numerous markets. For example, countries in which there are reportedly problems with transparency, characterized by sudden and unpredictable changes in policies such as licensing requirements and tax laws, include China, Brazil, Indonesia, West Africa, and Russia. Despite the existence

of various impediments, however, it is unusual to find that foreign field service providers are precluded altogether from entering foreign markets.

- According to economic analyses, there are three primary benefits of trade liberalization in oil and gas field services. First, there are the traditional gains that accrue to countries that are allowed to focus their productive efforts on areas in which they have a comparative advantage. Second, trade liberalization should have a positive impact on downstream markets by reducing the costs of exploration and production of oil and natural gas. Third, liberalization may yield additional gains through technology and knowledge spillovers.

Potential for Liberalization of Oil and Gas Field Services Under the General Agreement on Trade in Services

- Many of the impediments to trade that have been identified by industry participants are addressed to some degree by various trade agreements, including the General Agreement on Trade in Services (GATS). For example, trade impediments created by poor transparency, specific labor requirements, joint-venture requirements, limitations on foreign investment, and technology transfer requirements are addressed by the GATS principles contained in articles II (most-favored-nation treatment), III (transparency), VI (domestic regulation), XVI (market access), and XVII (national treatment) of the agreement.
- To date, however, WTO members have made relatively few commitments that specifically relate to oil and gas field services. Of the 144 WTO members, only 51 made binding commitments on market access and national treatment that specifically pertain to oil and gas field services. Of these, the majority of commitments could be considered “partial” commitments, in that members limited the scope of their obligation by listing some kind of reservation.
- On the basis of these existing commitments, there appears to be considerable room for further liberalization of oil and gas field services under the GATS. If the 93 WTO members who have yet to list any specific commitments were to schedule at least some commitments, this would offer the benefits of increased transparency, improved legal certainty, and the establishment of a baseline level of treatment such that a country cannot become more restrictive. Meanwhile, those countries that have scheduled partial commitments could liberalize further by reducing or eliminating any remaining significant restrictions on market access and national treatment.

Conclusion

- Oil and gas field services are among the most global of service activities. Most countries have at least some hydrocarbon resources, and all countries have a financial interest in developing any resources they possess. However, in some markets, service providers encounter impediments that have an adverse effect on

the nature and scope of their operations. The most significant of these impediments include poor transparency, specific labor requirements, joint venture requirements, limitations on foreign investment, and technology transfer requirements.

- Trade disciplines contained within the GATS address many of the impediments identified by industry representatives. In addition, with 144 signatories and an active round of negotiations presently underway, the GATS may afford an immediate avenue for pursuing liberalization of oil and gas field services.
- Because both the volume of trade and the effects of trade impediments in this sector cannot be measured at this time, a quantitative assessment of the costs of trade impediments or the benefits of liberalization is not possible. Nevertheless, improvements in transparency and the elimination of discriminatory practices likely will yield the traditional benefits of trade liberalization. In practical terms, further liberalization will improve the general business environment for oil and gas field service providers. This in turn is likely to enhance the level of competition, leading to lower costs associated with the exploration and extraction of oil and natural gas to the ultimate benefit of oil and gas producers, consumers, and the global economy.

GLOSSARY OF TERMS

Artificial lift	The extraction of crude oil and natural gas from slow-flowing wells through the use of mechanical, electrical, or hydraulic pumps, or by injecting various fluids into the well. See definition of natural lift.
Casing	A steel or iron pipe used to line the walls of a well. Casing supports the sides of the hole and prevents gas, water, or other fluids from entering the well.
Christmas tree	An assembly of valves, pressure gauges, and chokes installed at the top of a well. A Christmas tree is used to control the flow of oil and gas from the well and prevents blow-outs and leakages.
Chemostratigraphy	A geochemical technique used to find new oil and gas fields and increase the productivity of existing fields.
Concession	A right granted by the owner of a mineral resource (i.e., usually a national, state, or provincial government) to an oil company (concessionaire) to explore for and develop the mineral resource in exchange for the payment of royalties and taxes.
Continental shelf	A shallow platform that surrounds the continents, extending from the beach to an ocean depth of 450 feet.
Crude oil	A liquid comprised of more than 100 types of hydrocarbon molecules. See definition of hydrocarbon.
Day-rate contract	A contract by which the drilling contractor is paid by 24-hour increments.
Directional drilling	A method of drilling in which the wellbore is deflected off the vertical plane and drilled at an angle. See definition of horizontal drilling.
Downhole	Equipment used and activities that take place inside a well.
Downstream	Activities that bring oil and gas products to the consumer market, such as refining and marketing. See definition of upstream.
Drill bit	A tool used to create a flow path between an underground reservoir and the earth's surface. Equipped with sharp inserts, the drill bit cuts through layers of rock and earth as it is rotated at the end of the drill string.
Drilling fluid	A fluid that is pumped through the drill string to the bottom of the well. Also known as mud, drill fluid picks up rock cuttings from the bottom of the well and carries them to the surface.
Drill ship	A self-propelled floating vessel that specializes in deepwater drilling.
Drill string	A long assembly of drill pipe used to rotate the drill bit. In addition to a drill pipe, a drill string includes a rotating kelly, drill collars, subs, and bits.

Enhanced oil recovery (EOR)	The increased recovery from a reservoir achieved by artificial means, such as the injection of steam, chemicals, gases or pressure for the sole purpose of aiding in lifting or stimulating any remaining reserves in the reservoir.
Fishing	An operation which attempts to retrieve tools, cable, or other objects which have been lost inside a well.
Footage contract	A contract in which the drilling contractor is paid by the depth of the well.
Floating production, storage, and offloading (FPSO) vessel	A ship stationed above or near an offshore well to which fluids from the well are transported by flowlines and then separated and treated.
Horizontal drilling	A method of drilling in which the wellbore is deflected to a horizontal plane.
Hydrocarbon	An organic chemical compound made up of hydrogen and carbon atoms.
Jackup rig	A mobile offshore drilling rig with legs that are anchored to the ocean floor. Jackup rigs can work in depths of up to 550 feet.
Lease	A contract signed by a landowner (lessor) and a company or individual (lessee) that grants the lessee the right to explore for and develop mineral resources. See definition of concession.
Log	A record of the rock properties of a well.
Measurement-while-drilling (MWD)	A technique used to analyze drill cuttings and/or downhole gases for the purpose of detecting the presence of oil and natural gas.
Microdrilling	The drilling of small-diameter microholes using transportable coiled tubing that is equipped with miniaturized seismic and other geophysical equipment.
Mobile offshore drilling unit (MODU)	Drilling rigs used in offshore operations. Drilling rigs are either bottom-supported or floating and include drill ships, jackups, submersible rigs, and semisubmersible rigs.
Natural gas	A gas made up of different types of hydrocarbon molecules each having between one and four carbon atoms.
Natural lift	The flow of underground oil or gas caused by natural pressure within the formation.
Non-associated gas	Natural gas that is not in contact with crude oil in the reservoir.
Offshore reserves	Oil and gas reserves under the seabed.
Onshore reserves	Oil and gas reserves underground.
Petroleum	Crude oil and natural gas. See definitions of crude oil and natural gas.

Production sharing agreement (PSA)	A contract between a national, or state-owned, oil company, and a private firm wherein the former contributes a portion of capital costs for exploration and production. PSAs often involve the establishment of a joint venture between the national oil company and the private-sector participant. Also known as a production sharing contract (PSC).
Reservoir	The deposits of oil and gas located in pores of a rock body located beneath the earth's surface.
Rig	The derrick and accompanying surface equipment of a drilling unit.
Royalty	Payment to a landowner for the right to explore for and develop mineral resources in the form of a portion of mineral production, commonly set at one-eighth of total production.
Seismic imaging	A method of exploration in which sound waves are used to determine the presence of oil and/or gas within a rock formation.
Semisubmersible drilling rig	A floating offshore drilling rig that is partially submerged and anchored into place.
Submersible drilling rig	A movable offshore drilling rig whose compartments are flooded, allowing part of the rig to rest on the ocean floor. Submersible rigs are used in depths up to 175 feet.
Tubing	A narrow pipe that is used in a well to conduct oil and gas from an underground reservoir to the earth's surface.
Turnkey contract	A contract in which the drilling contractor is paid a lump sum for the completion of a well.
Upstream	A term that refers to the exploration for and extraction of oil and gas from the ground, in contrast to downstream activities, which pertain to the refining, marketing, and sale of oil and gas products to end consumers.
Waterflood	A method used to increase the recovery of oil from a depleted reservoir in which water is pumped down into a well in order to force oil to flow to the surface.
Wellbore	The hole drilled through the earth's surface when searching for underground oil and gas.
Well stimulation	A method used to increase oil and gas production from a well. Two common types of well stimulation treatment include fracturing, which involves the high pressure injection of fluids into a well to produce cracks and fractures in the reservoir rock; and acidization, in which acid is pumped down a well to stimulate the flow of oil.
Wildcat well	An exploratory well drilled to find new reserves of oil and gas in areas that were previously unexplored.

Wireline

A wire rope, less than one-half of an inch in diameter, used to raise and lower tools in a well.

Source: Norman J. Hyne, *Nontechnical Guide to Petroleum Geology, Exploration, Drilling, and Production*, 2nd ed. (Tulsa, Oklahoma: PennWell, 2001); American Petroleum Institute, *Introduction to Oil and Gas Production*, June 1996; and Standard & Poor's Industry Surveys, *Oil & Gas: Equipment and Services*, July 11, 2002.

CHAPTER 1

INTRODUCTION

Objective and Scope

On June 18, 2002, the United States International Trade Commission (USITC or the Commission) received a request letter from the United States Trade Representative (USTR) (see appendix A) to conduct a fact-finding investigation of global oil and gas field services markets. USTR initiated this request in reference to ongoing energy services negotiations in the World Trade Organization (WTO) under the General Agreement on Trade in Services (GATS). In its letter, USTR observed that although energy services are clearly of great importance to the global economy, they had not been carefully considered prior to the present round of trade negotiations. USTR therefore suggested that a close examination of the nature of trade in oil and gas field services and the impediments to such trade could contribute substantially to negotiations by increasing the level of understanding of trade in this industry. The current study is the third in a series of investigations on the energy services sector requested by USTR. The Commission published reports on electric power services and natural gas services, respectively, in November 2000 and October 2001.¹

As requested by USTR, this study describes the various activities involved in the provision of oil and gas field services; discusses the nature of trade in the sector; and examines the extent of impediments to trade and the potential benefits of trade liberalization. Because oil and gas field services are conducted in a large number of countries, the study identifies impediments that are relevant multilaterally. For the purpose of the study, oil and gas field services are broadly defined to include exploration and evaluation activities; drilling activities; and well development and completion activities (see chapter 2).

Background Information

The GATS, one of the Uruguay Round agreements, broke new ground as the first international agreement to apply to trade in service industries. In addition, since the GATS includes the provision of services through a commercial presence in its definition of services trade, the treaty also became the first multilateral, legally enforceable agreement to cover the right of establishment through foreign direct investment.

¹ The report on electric power services is entitled *Electric Power Services: Recent Reforms in Selected Foreign Markets* (USITC publication 3370) and on natural gas services, *Natural Gas Services: Recent Reforms in Selected Markets* (USITC publication 3458). Copies of these reports may be obtained by contacting the Office of the Secretary by telephone at 202-205-2000 or by accessing the USITC Internet website at <http://www.usitc.gov>.

However, the successful conclusion of the GATS in 1994 represented only one step toward achieving full liberalization of international trade in services, as many countries were unable or unwilling to open their markets completely.² For some, opening markets to participation by foreign firms involved making regulatory, legislative, and even constitutional changes that would take considerable time to implement. Others may have declined to liberalize due to domestic considerations, including the concern that foreign competition might adversely affect domestic firms. Still others may have delayed liberalization to gain bargaining leverage. Regardless of the reasons, negotiators recognized that full services trade liberalization would be a lengthy, incremental process, and so built into the agreement provisions requiring successive rounds of negotiations. In accordance with these provisions, WTO members began a new round of services trade negotiations in January 2000.

These renewed negotiations are intended to broaden and deepen the coverage of GATS obligations by extending the scope of the agreement to a wider range of industries and eliciting stronger commitments from WTO members. Energy services figure prominently among industries that may benefit from more thorough coverage under the GATS. However, there is a need to define energy services, including oil and gas field services, more clearly, and to conceptualize appropriate means of addressing this sector within the framework of the GATS.³ This report endeavors to address some of these challenges by helping WTO members better understand the nature of this industry, identify principal trade impediments, and examine the potential relevance of trade disciplines to oil and gas field services.

Approach and Data Sources

The information and analysis contained in this report were developed by Commission staff using primary and secondary data sources. USITC staff conducted interviews with technical experts from the industry, U.S. and foreign government bodies, academic organizations, multilateral organizations, and consultancies in the United States and in foreign countries. USITC staff also extensively reviewed secondary sources, though it should be noted that there currently appears to be a paucity of academic literature on the subject industry. With few exceptions, the information presented in this study is not organized on a country-by-country basis, but rather on the basis of issues such as the types of operating environments and market challenges faced by global oil and gas field services firms, principally using country-specific information in an illustrative manner.

² See Bernard Hoekman, "Tentative First Steps: An Assessment of the Uruguay Round Agreement on Services," paper presented at a World Bank conference, Jan. 26-27, 1995; and Pierre Sauve, "Assessing the General Agreement on Trade in Services: Half Full or Half Empty?" *Journal of World Trade*, Vol. 29, No. 4, Aug. 1995.

³ Communication from the United States to the World Trade Organization Committee on Specific Commitments, "Classification of Energy Services," document No. S/CSC/W/27, May 18, 2000, pp. 3-5.

Organization of the Report

After providing a detailed description of the types of activities conducted by oil and gas field services firms (chapter 2), the report presents a brief overview of the oil and gas field services industry (chapter 3), including a discussion of the structure of the industry and the nature and extent of trade. The report then examines impediments to trade in the oil and gas field services industry and assesses the potential benefits of trade liberalization (chapter 4). The report concludes with a discussion of the applicability of key GATS principles to oil and gas field services, and assesses the potential for trade impediments identified in this sector to be addressed effectively under the GATS (chapter 5).

CHAPTER 2

DESCRIPTION OF OIL AND GAS FIELD SERVICES

Oil and gas field services comprise a host of activities related to the development of oil and natural gas resources (figure 2-1). Analysts typically divide these activities into two broad categories: drilling and support activities. Firms providing contract drilling services supply land and sea rigs, other specialized equipment, and expertise to oil and gas producers on a contract basis. Drilling contracts take several forms: day-rate contracts, which pay drillers for each 24-hours of operation; footage contracts, which pay by the depth of the well; and turnkey contracts, which pay the drilling contractor a fixed sum for the completed well. Firms in the “support activities” sector provide a variety of services. Seismic imaging and analysis provides support for decision-making before drilling takes place. Offshore support activities and measurement-while-drilling support the drilling activity itself. Artificial lifting and well stimulation services aid in the recovery of oil and gas after the well has been drilled.¹

Exploration and Evaluation

Oil and gas reserves are located beneath the earth’s surface in reservoirs held in sedimentary rock. Historically, the difficulty of locating underground reservoirs made prospecting for oil by petroleum companies an expensive and risky business. For example, during much of the 20th century, drilling a “wildcat” well had about a one-in-five chance of success.² Low odds of success, combined with the expense of prospective drilling, motivated development of more effective means of identifying prospective fields.

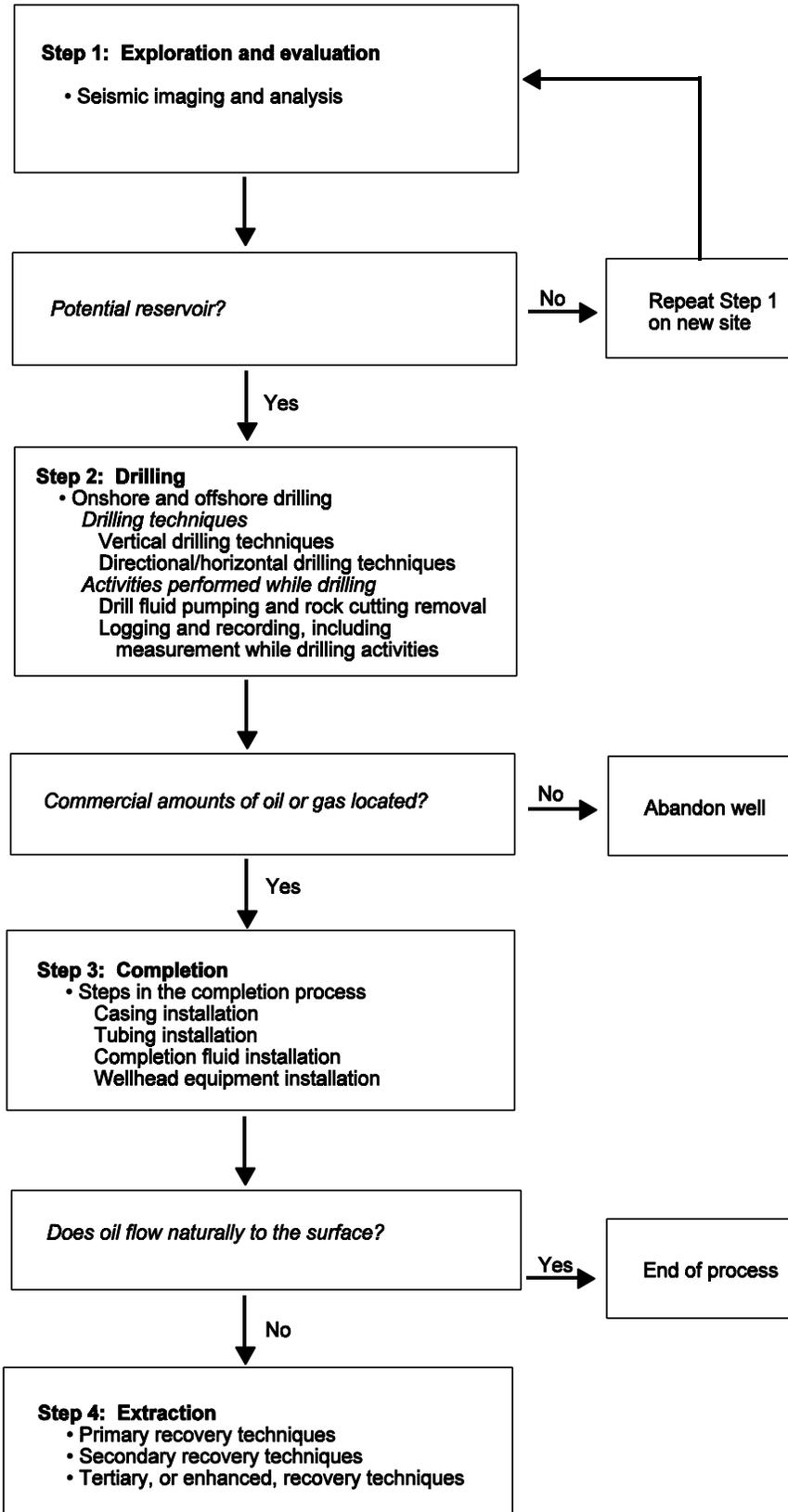
Seismic techniques, which use acoustic signals to determine the structure of underground geologic formations, have become increasingly effective in locating oil and gas. Seismic imaging involves measuring the time that it takes for an acoustic signal to travel from a “source” to a “receiver” and evaluating the strength of the signal upon its return.³ On land, the source is typically a large truck that creates sound vibrations by thumping the ground. At sea, the source is often an air gun which produces sound waves by releasing high-pressure air bubbles into the water. The seismic energy produced by the source travels down through the subsurface rocks. As acoustic waves strike successive rock layers, they are reflected back to the

¹ Standard & Poors Industry Surveys, *Oil & Gas: Equipment and Services*, July 11, 2002, pp. 15 and 23.

² U.S. Department of Energy (USDOE), Energy Information Administration (EIA), *Oil Market Basics*, found at Internet address <http://www.eia.doe.gov>, retrieved Dec. 3, 2001.

³ Standard & Poor’s Industry Surveys, *Oil & Gas: Production & Marketing*, Apr. 4, 2002, p. 20.

Figure 2-1
Exploration and well development



Source: Compiled by the U.S. International Trade Commission.

surface as echoes. The returning echoes are recorded by receivers, called geophones for land operations and hydrophones for subsea operations.⁴ Since different geologic structures reflect acoustic waves in predictable patterns, the data provided by the echoes can be used, with the help of computer software, to construct a picture of underground rock layers. These subsurface maps are then analyzed and evaluated to gauge the likelihood of finding oil and/or gas.

Oil was first discovered using a crude seismic system in 1928.⁵ Technological advances over the next 50 years produced increasingly accurate two-dimensional image maps. In the 1980s and 1990s, however, still more advanced technology and better data collection techniques permitted the development of three-dimensional (3-D) subsurface images. Two-dimensional techniques required that receivers be laid out along a line to collect vibrations, providing a cross-sectional image of subsurface layers. Three-dimensional techniques, however, require receivers to be laid out as a grid, allowing scientists to map a cube and create 3-D computer images of subsurface formations.⁶ More recently, four-dimensional (4-D) images have been developed by analyzing 3-D images over time. The 4-D time-lapse technique is expected to be particularly useful in monitoring reservoirs by allowing operators to visualize fluid movements between wells and even uncover overlooked pockets in and around existing fields.⁷

Thus, technological advances over the past 70 years have improved the array of subsurface mapping techniques dramatically, greatly enhancing the ability of geologists and oil companies to locate promising drilling sites. Today's advanced techniques also allow companies to eliminate poor prospects, reducing time and money spent on drilling nonproducing holes and, overall, increasing the likelihood of striking oil from about one-in-five to one-in-three.⁸

Drilling

Vertical Drilling

Although seismic imaging helps improve the accuracy of information regarding the potential presence of subsurface oil and gas, the only way to confirm the existence of

⁴ Norman J. Hyne, *Nontechnical Guide to Petroleum Geology, Exploration, Drilling, and Production*, 2nd ed. (Tulsa, Oklahoma: PennWell, 2001), pp. 213-218.

⁵ Hyne, *Nontechnical Guide to Petroleum Geology, Exploration, Drilling, and Production*, p. 213.

⁶ USDOE, EIA, *Oil Market Basics*, found at Internet address <http://www.eia.doe.gov>, retrieved Sep. 18, 2002.

⁷ According to McKinsey & Co, the net benefit to the oil industry from 3-D seismic technology amounts to \$11 billion per year. Standard & Poor's Industry Surveys, *Oil & Gas: Production & Marketing*, Apr. 4, 2002, p. 20; and "Into Deeper Water," *The Economist*, Dec. 6, 2001, found at Internet address <http://www.economist.com>, retrieved Sep. 10, 2002.

⁸ Some sources now place the likelihood of striking oil at one-in-two. USDOE, EIA, *Oil Market Basics*, found at <http://www.eia.doe.gov>, retrieved Dec. 3, 2001.

reservoirs is to conduct exploratory drilling. Thus, after a likely prospect has been identified, a drilling company develops a drill plan and begins to dig exploratory, or test, wells.

In a typical onshore drilling operation, a rotary drilling rig placed above the drilling site rotates a long assembly of steel pipe known as a drill string. The drill string extends from the rig floor to the bottom of the well and is capped off by a drill bit. As the drill string is rotated, the drill bit cuts through layers of soil and rock to carve out a vertical hole known as a wellbore. Normal drilling operations include drilling a starter hole, adding new sections of drill pipe as the well deepens, hoisting the drill string to the surface to replace a worn out drill bit, and running it back to the bottom of the well.⁹

Over the past century, drilling has become a complex task with many complementary activities operating in tandem. For example, as a drill bit cuts through rock layers, drilling fluid is pumped down through the drill string to the bottom of the well. Also known as mud, drilling fluid is a combination of clays, polymers, and chemicals used to cool the rotating drill, help loosen rock cuttings, and control downhole pressures. Drilling mud also picks up rock cuttings from the bottom of the well and flushes them to the surface in the space between the drill string and the inside of the well, removing debris that would otherwise accumulate at the bottom and hinder drilling operations. At the surface, the cuttings are removed and the mud is reused.¹⁰

Directional drilling

Although oil wells have been drilled vertically into the earth's surface for more than a century, new technology developed within the past two decades has improved the use of a technique known as directional drilling. During directional drilling, a well is drilled vertically to a point and then deflected at an angle. An increasingly popular and effective form of directional drilling is known as horizontal drilling. In horizontal drilling, the top part of the well is drilled straight down to a predetermined distance, whereupon the drill string and drill bit are deflected at a horizontal angle, penetrating potential reservoirs laterally. Horizontal drilling can reduce the number of wells required to drain a reservoir, while increasing the amount of retrievable oil to between 50 percent and 75 percent of a reservoir's capacity. Moreover, horizontal drilling allows additional wells to be drilled into a reservoir without interrupting the production of existing wells. According to a 1999 Arthur Andersen survey, oil companies rated horizontal drilling as the second-most-important technical method of the industry, behind seismic imaging and analysis.¹¹

⁹ Standard & Poor's Industry Surveys, *Oil & Gas: Equipment and Services*, July 11, 2002, p. 14.

¹⁰ Ibid.

¹¹ Standard & Poor's Industry Surveys, *Oil & Gas: Production & Marketing*, Apr. 4, 2002, p. 19.

Offshore drilling

The growing world demand for oil and gas, combined with the depletion of many onshore fields, have pushed oil companies offshore into increasingly deep water. Offshore drilling operations have spread from the Gulf of Mexico, where they started in the 1960s, to continental shelf locations throughout the world.

The major difference between land drilling and offshore drilling operations is the platform upon which the drilling rig is mounted. Known as mobile offshore drilling units (MODU), offshore drilling rigs are either “bottom supported” or floating. The bottom-supported category includes submersibles and jackup rigs, while floating rigs include semisubmersibles and drillships. Submersible rigs float on the water’s surface while being moved into place. Once positioned, special compartments are flooded, submerging the lower part of the rig to the seafloor. Submersibles, used in depths up to 175 feet, are relatively immune to waves and currents due to the fact that they rest on the ocean floor. By contrast, jackup rigs lower steel legs that rest on the bottom and, literally, jackup the entire rig to a position above any anticipated waves or swells. Jackup rigs, which are also very stable, are used in water less than 550 feet deep.¹²

With semisubmersibles, flooded pontoons partially lower the MODU into the water. After being anchored into place above the ocean floor, a semisubmersible provides a relatively stable platform from which to conduct drilling operations. The drill ship, the least stable type of drilling platforms, resembles a typical transportation ship. Though highly mobile and able to drill wells up to 30,000 feet deep in water up to 10,000 feet,¹³ they are subject to the movement of wind, waves, and currents. As a result, most advanced drill ships possess global positioning systems that continually activate thrusters to prevent the ship from straying. The latest generation of drillships features significantly greater automation and permits many operations to be performed concurrently, which offers time and labor savings in addition to enhanced worker safety.¹⁴

Floating production, storage, and offloading vessels are specialized ships or floating structures anchored to the ocean floor that extract oil and gas, provide temporary storage, and subsequently offload the production to transport vessels or a pipeline. Some facilities also provide offshore gas-processing services, which may include separating propane from natural gas to produce liquefied petroleum gas, liquefying natural gas for transport, or converting natural gas into synthetic fuel.¹⁵ Often less

¹² Standard & Poor’s Industry Surveys, *Oil & Gas: Equipment and Services*, July 11, 2002, p. 13.

¹³ Ibid.

¹⁴ *International Petroleum Encyclopedia 2000*, “Drillship Technologies Introduce Simultaneous Operations,” found at Internet address <http://orc.pennnet.com>, retrieved Oct. 24, 2001.

¹⁵ *International Petroleum Encyclopedia 1998*, “Floating Production Technology at Use in Variety of Projects,” and “Floaters Dominate Northwest Europe’s Offshore Oil Development Operations,” found at Internet address <http://orc.pennnet.com>, retrieved Oct. 24, 2001.

expensive to construct than fixed installations, floating installations also can be moved to different locations and offer the only viable means of developing resources in very deep waters.

Logging and Recording

As a drilling contractor drills an exploratory well, tests are conducted to measure the rock and fluid properties of underground formations. In the past, well testing, also known as wireline logging, involved lowering electronic instruments into the wellbore on a “wireline.” Data were then transmitted to the surface and recorded, or logged. Typically, wireline equipment was lowered into the wellbore only after drilling had been completed. In some cases, it was necessary to interrupt drilling to perform the time-consuming task of pulling several thousand feet of drill string out of the well so wireline equipment could be lowered. Starting in the 1980s, however, measurement-while-drilling (MWD) techniques allowed real-time data to be relayed and recorded while a well was being drilled. Since MWD can be performed without interrupting drilling, it has provided substantial savings to drilling contractors in terms of time and expense.¹⁶

Development and Completion

If a test well is drilled to a certain depth without finding commercial amounts of oil, the “dry hole” is plugged and abandoned. Plugging is the placement of cement plugs inside a well so that the well remains closed. However, if commercial amounts of oil or gas are discovered, development and completion activities begin.

Development and completion involves the construction of a flow path through which oil and gas can pass from the reservoir to the earth’s surface. First, a well is cased. Casing involves assembling sections of steel pipe into a long length of steel tube known as a casing string, which is inserted into the wellbore and cemented into place.¹⁷ Casing not only prevents the well from caving in but also keeps underground water or other fluids from entering the wellbore.¹⁸ Perforations at the bottom of the casing allow oil and gas to flow into the wellbore.

After casing is installed, small-diameter steel pipe known as tubing is strung together and run to the bottom of the cased hole. While casing is cemented to the sides of the well, tubing is suspended in the wellbore and can be pulled out for replacement or repair. Tubing not only provides a flow path for oil or gas but also protects the casing from corrosion. Treated water or diesel fuel, called completion fluid, is typically

¹⁶ Standard & Poor’s Industry Surveys, *Oil & Gas: Equipment and Services*, July 11, 2002, p. 16.

¹⁷ Hyne, *Nontechnical Guide to Petroleum Geology, Exploration, Drilling, and Production*, p. 333.

¹⁸ Standard & Poor’s Industry Surveys, *Oil & Gas: Production & Marketing*, Apr. 4, 2002, p. 16.

pumped into the space between the tubing and casing.¹⁹ Last, wellhead equipment, comprised of valves and gauges, is installed at the surface. Often referred to as a Christmas tree, wellhead equipment seals the well, controls the flow of hydrocarbons, and prevents leaking and blow-outs on the surface.²⁰

Extraction

Once a well is completed, oil and gas are extracted from the well. In most cases oil initially flows freely due to built up pressures in the reservoir, a process known as natural lift. As producing wells mature, however, underground pressure dissipates and the flow rate begins to decline. In such cases, artificial lifting techniques employing a variety of pumps are used to draw oil to the surface and restore production. When pumping techniques also falter, other techniques such as the waterflood method are used to continue production. The waterflood method involves the high-pressure injection of water into a reservoir, forcing remaining oil out of reservoir cavities to the wellbore area so that it can be pumped to the surface.

Enhanced oil recovery methods, such as well stimulation, may also be used to increase oil and gas production.²¹ Two common methods of well-stimulation treatment are fracturing and acidization. Fracturing techniques involve the high-pressure injection of fluids into a well, creating enough pressure to produce cracks and fractures in the reservoir rock, which may be impeding oil flow. A second step requires the pumping of prop agents²² to “prop open” the fractures after pumping ceases and the fracture fluid drains out. After the fracturing process is complete, oil flows more freely from the reservoir rock into the wellbore. Acidizing techniques entail pumping acid down the well. Once in place, the acid dissolves formation particles, effectively cleaning the formation and allowing oil to flow more freely into the wellbore.

¹⁹ Hyne, *Nontechnical Guide to Petroleum Geology, Exploration, Drilling, and Production*, p. 333.

²⁰ Standard & Poor’s Industry Surveys, *Oil & Gas: Equipment and Services*, July 11, 2002, p. 15.

²¹ USDOE, EIA, *Oil Market Basics*, found at <http://www.eia.doe.gov>, retrieved Dec. 3, 2001.

²² Materials used as prop agents include sand, ceramic bits, and aluminum oxide pellets.

CHAPTER 3

NATURE OF TRADE IN OIL AND GAS FIELD SERVICES

Field Service Providers

The oil and gas field services industry comprises two tiers of firms: large, integrated companies with competence in a broad range of activities; and small- and medium-sized firms that perform specialized activities. Petroleum companies often hire these large, integrated oil and gas field services firms to manage field services projects. These large firms will in turn hire smaller field services companies to carry out specialized services for which they may not have in-house capabilities (e.g., drilling).¹ In 2001, three of the largest integrated oil and gas field services companies—Schlumberger (France), Halliburton (United States), and Baker Hughes (United States)—recorded sales revenues of \$13.7 billion, \$13 billion, and \$5.4 billion, respectively, equivalent to approximately 30 percent of global upstream expenditures.² By contrast, the two largest firms providing drilling services, Transocean (U.S.) and Nabors Industries (U.S.), had revenues in 2001 of \$2.8 billion and \$2.1 billion, respectively.³

Although large firms have a distinct competitive advantage in the provision of services that are highly capital intensive, there nevertheless remain considerable opportunities for small- and medium-sized enterprises to provide services. For example, geological, geophysical, and other prospecting services can be provided by relatively small specialized firms. Onshore drilling does not necessarily require the expertise of large multinational enterprises, nor do drilling support services like mud engineering and supply, workover and well repair services, reservoir engineering, and some secondary recovery services. A look at the U.S. domestic market for oil and gas field services reveals that, despite the strong role played by the large integrated service providers, there are hundreds of small- and medium-sized companies competing in the market. For example, *Ward's Business Directory* lists 56 companies providing drilling services, 98 companies providing oil and gas exploration services, and 32 companies providing other oil and gas field services in the United States. Most of these companies had fewer than 100 employees and

¹ U.S. industry representatives, interviews with Commission staff, Oct. 8-10, 2002.

² Standard and Poors estimates global upstream expenditures in 2001 to be slightly more than \$100 billion. Standard and Poors Industry Surveys, *Oil & Gas: Equipment and Services*, July 11, 2002, p. 7; Baker Hughes 2001 Annual Report, p. 1; Halliburton 2001 Annual Report, p. 66; and Schlumberger 2001 Annual Report, found at Internet address <http://www.schlumberger.com>, retrieved Nov. 1, 2002.

³ Standard and Poors Industry Surveys, *Oil & Gas: Equipment and Services*, July 11, 2002, p. 8.

annual sales of less than \$10 million.⁴ Similarly, Norway hosts more than 50 small- and medium-sized field services firms, and the United Kingdom Continental Shelf also offers a growing market for niche players.⁵

Challenging market conditions and the desire to acquire technology have fostered a number of significant mergers and acquisitions among oil and gas field services firms in recent years. Major transactions in 2001 included the acquisition of R&B Falcon by Transocean Sedco Forex (both U.S.-based) to form the largest deepwater drilling firm in the world,⁶ the merger of Pride International with Marine Drilling (both U.S.-based) in a \$2-billion stock transaction to form one of the largest offshore drilling contractors,⁷ and the announcement of a \$3-billion merger between Global Marine and Santa Fe International (both U.S.-based), making the combined company the second-largest drilling contractor worldwide.⁸ In the exploration and development segments, Halliburton and DSND of Norway announced plans to merge their offshore field service businesses to create a company with annual sales of \$800 million,⁹ and Devon Energy (U.S.) committed to acquire Anderson Exploration of Canada for \$4.6 billion.¹⁰

Field Service Consumers

The primary consumers of oil and gas field services are oil and gas exploration and production (E&P) companies (figure 3-1). E&P companies may be grouped into three categories: major integrated oil and gas companies, national oil companies, and independent oil companies. The largest integrated firms, the so-called “supermajors,” include firms such as ExxonMobil (United States), Royal Dutch/Shell Group (Netherlands/United Kingdom), and TotalFinaElf (France).¹¹ These firms are “integrated” in the sense that they are engaged in the production, refining, and marketing of oil and gas. By contrast, national oil companies tend to be

⁴ *Ward's Business Directory of U.S. Private and Public Companies*, 45th ed., (Farmington Hills, MI: The Gale Group, Inc. 2003), pp. 11-13.

⁵ Norwegian industry representatives, interview with Commission staff, Stavanger, Norway, Nov. 11, 2002; and British industry officials, interview with Commission staff, Aberdeen, Scotland, Nov. 13, 2002.

⁶ In May 2002, the company changed its name to Transocean. Standard & Poor's Industry Surveys, *Oil and Gas: Equipment and Services*, July 11, 2002, p. 11.

⁷ Robin Sidel and Alexei Barrionuevo, “Pride International to Merge with Marine Drilling,” *Wall Street Journal*, May 24, 2001, p. A4.

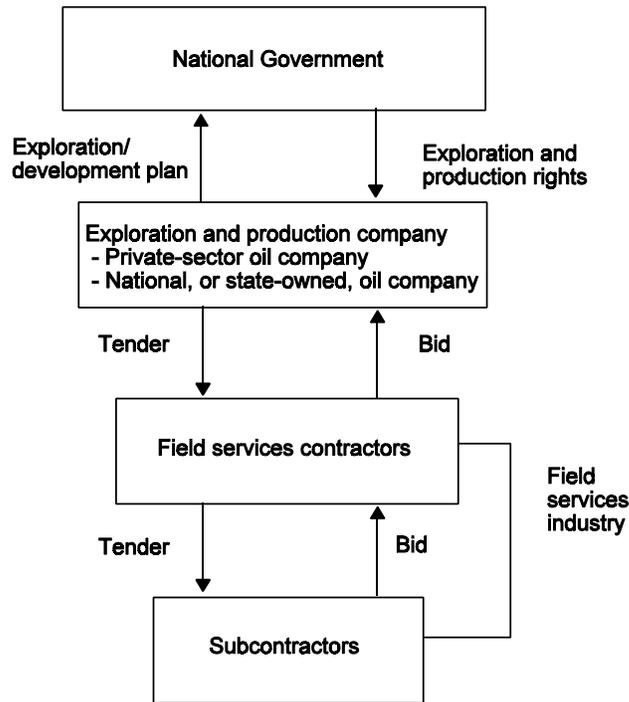
⁸ Matthew Jones, “Global Marine Third-quarter Earnings Almost Double,” *Financial Times*, Oct. 15, 2001, found at Internet address <http://news.ft.com>, retrieved Oct. 17, 2001.

⁹ The new company was scheduled to commence operations on January 1, 2002. Matthew Jones, “DSND and Halliburton May Merge Subsea Units,” *Financial Times*, Oct. 18, 2001, found at Internet address <http://news.ft.com>, retrieved Oct. 19, 2001, and “Halliburton and DSND Sign Letter of Intent to Form,” Halliburton 2001 Press Releases, found at Internet address <http://www.halliburton.com>, retrieved Nov. 4, 2002.

¹⁰ Ken Warn and Sheila McNulty, “U.S. Energy Groups Agree Takeover Deals,” *Financial Times*, Sept. 5, 2001, found at Internet address <http://news.ft.com>, retrieved Sept. 5, 2001.

¹¹ Standard & Poors, *Oil & Gas: Production and Marketing*, Industry Survey, Oct. 17, 2002, pp. 15-16.

Figure 3-1
Overview of the oil and gas field services contracting process



Source: Developed by the U.S. International Trade Commission.

engaged in production and, to some extent, refining, but generally have less involvement in the marketing segment. The largest national oil and gas companies include Saudi Aramco (Saudi Arabia), Iraq National Oil Co. (Iraq), Kuwait Petroleum (Kuwait), National Iranian Oil Co. (Iran), and Petróleos de Venezuela S.A. (Venezuela). Finally, the “independent” companies, such as Anadarko Petroleum (United States) and Burlington Resources (United States) tend to focus exclusively on the exploration and production segment, leaving refining and marketing to the integrated companies.¹²

International E&P companies compete with one another for the right to explore for and produce oil and gas. Although major oil and gas reserves are concentrated in a few regions (tables 3-1 and 3-2), most countries have at least some hydrocarbon resources and all have a financial interest in developing their resources. Government policy concerning the management of resource rights has evolved considerably in the century and a half since oil entered commercial production.¹³ Initially, governments had little direct involvement and simply granted exploration and production rights to private companies through contractual arrangements known as concessions. In

¹² Ibid.

¹³ For a detailed discussion of the history of the oil industry and related government policies, see Daniel Yergin, *The Prize* (New York: Simon and Schuster, 1991).

Table 3-1
Overview of major oil-producing countries: Selected market characteristics, 2001

	Proved reserves	Percent of world total	Production	Percent of world total	Projected duration of proved reserves¹	Consumption	Net trade
	<i>Billion barrels</i>		<i>Thousand barrels daily</i>		<i>Years</i>	<i>Thousand barrels daily</i>	<i>Thousand barrels daily</i>
Asia Pacific							
Australia	3.5	0.3	733	0.9	14.0	845	-239
China	24.0	2.3	3,308	4.6	19.9	5,041	-1,600
India	4.8	0.5	782	1.0	17.8	2,072	-1,100
Indonesia	5.0	0.5	1,410	1.9	10.1	1,095	428
Malaysia	3.0	0.3	788	1.0	11.2	407	270
Europe							
Netherlands	⁽²⁾	⁽²⁾	⁽²⁾	⁽²⁾	⁽²⁾	948	⁽²⁾
Norway	9.4	0.9	3,414	4.5	7.8	213	3,300
United Kingdom	4.9	0.5	2,503	3.3	5.6	1,649	1,050
Former Soviet Union							
Russia	48.6	4.6	7,056	9.7	19.1	2,456	4,910
Kazakhstan	8.0	0.8	828	1.1	27.6	155	631
North America							
Canada	6.6	0.6	2,763	3.6	8.8	1,941	³ 822
United States	30.4	2.9	7,717	9.8	10.7	19,633	⁴ -10,300
Latin America							
Argentina	3.0	0.3	822	1.1	10.1	404	335
Brazil	8.5	0.8	1,337	1.9	17.5	1,865	³ -528
Colombia	1.8	0.2	627	0.9	7.7	220	344
Mexico	26.9	2.6	3,560	4.9	21.7	1,813	1,600
Trinidad & Tobago	0.7	0.1	135	0.2	15.7	⁽²⁾	⁽²⁾
Venezuela	77.7	7.4	3,418	4.9	63.5	⁽²⁾	2,590
Africa							
Algeria	9.2	0.9	1,563	1.8	17.6	200	³ 1,363
Angola	5.4	0.5	731	1.0	20.3	⁽²⁾	⁵ 711
Egypt	2.9	0.3	758	1.0	11.1	551	128
Libya	29.5	2.8	1,425	1.9	57.3	⁽²⁾	1,250
Nigeria	24.0	2.3	2,148	2.9	30.8	⁽²⁾	1,900

See footnotes at end of table.

Table 3-1—Continued
Overview of major oil-producing countries: Selected market characteristics, 2001

	Proved reserves	Percent of world total	Production	Percent of world total	Projected duration of proved reserves¹	Consumption	Net trade
	<i>Billion barrels</i>		<i>Thousand barrels daily</i>		<i>Years</i>	<i>Thousand barrels daily</i>	<i>Thousand barrels daily</i>
Middle East							
Iran	89.7	8.5	3,688	5.1	67.4	1,131	2,700
Iraq	112.5	10.7	2,414	3.3	⁽⁶⁾	⁽²⁾	⁷ 1,500
Kuwait	96.5	9.2	2,142	2.9	⁽⁶⁾	206	1,800
Oman	5.5	0.5	959	1.3	15.8	⁽²⁾	909
Qatar	15.2	1.4	783	1.0	55.5	30	⁸ 747
Saudi Arabia	261.8	24.9	8,768	11.8	85.0	1,347	6,710
United Arab Emirates ⁹	97.8	9.3	2,422	3.2	⁽⁶⁾	282	1,800
World total	1,050.0		74,493			75,291	

¹ Derived from the ratio of reserves to production. This figure represents the length of time, in years, that remaining reserves would last if production were to continue at current levels.

² Not available.

³ Calculated as production minus consumption.

⁴ Figure is January-September 2002 estimate.

⁵ Figure is 2000 estimate.

⁶ Over 100 years.

⁷ Figure is January-July 2002 estimate.

⁸ Figure is 2002 estimate.

⁹ The United Arab Emirates comprises seven states: Abu Dhabi, Ajman, Al Fujayrah, Ash Shariqah, Dubai, Ra's al Khaymah, and Umm al Qaywayn.

Source: BP, *The Statistical Review of World Energy*, June 2002, pp. 4, 6, & 9; *International Petroleum Encyclopedia* (Tulsa, Oklahoma: PennWell, 2001), pp. 271-274; and U.S. Department of Energy (USDOE), Energy Information Administration (EIA), *Country Analysis Briefs*, found at Internet address <http://www.eia.doe.gov/emeu/cabs/contents.html>, retrieved Nov. 20, 2002.

Table 3-2
Overview of major natural gas-producing countries: Selected market characteristics, 2001

	Proved reserves	Percent of world total	Production	Percent of world total	Projected duration of proved reserves¹	Consumption	Net trade²
	<i>Trillion cubic meters</i>		<i>Billion cubic meters</i>		<i>Years</i>	<i>Billion cubic meters</i>	<i>Billion cubic feet</i>
Asia Pacific							
Australia	2.55	1.6	32.7	1.3	77.9	22.5	³ 357
China	1.37	0.9	30.3	1.2	45.1	27.7	⁴ 2.6
India	0.65	0.4	26.4	1.1	24.5	26.3	⁴ 0.1
Indonesia	2.62	1.7	62.9	2.6	41.6	29.7	³ 1,261
Malaysia	2.12	1.4	47.4	1.9	44.8	21.6	³ 798
Europe							
Netherlands	1.77	1.1	61.4	2.5	25.1	39.3	917
Norway	1.25	0.8	57.5	2.3	21.7	4.5	³ 1,825
United Kingdom	0.73	0.5	105.8	4.3	6.9	95.4	166
Former Soviet Union							
Russia	47.57	30.7	542.4	22.0	83.1	372.7	³ 4,853
Kazakhstan	1.84	1.2	10.8	0.4	(⁵)	10.1	⁴ 0.7
North America							
Canada	1.69	1.1	172.0	7.0	9.8	72.6	3,719
United States	5.02	3.2	555.4	22.5	9.2	616.2	-3,722
Latin America							
Argentina	0.78	0.5	38.4	1.6	20.3	33.2	³ 156
Brazil	0.22	0.1	7.7	0.3	28.8	10.9	⁶ -74
Colombia	0.12	0.1	6.1	0.2	20.1	6.1	(⁷)
Mexico	0.84	0.5	34.7	1.4	24	33.7	-110
Trinidad & Tobago	0.66	0.4	12.9	0.5	51.4	(⁵)	³ 124
Venezuela	4.18	2.7	28.9	1.2	(⁸)	28.9	(⁷)
Africa							
Algeria	4.52	2.9	78.2	3.2	(⁸)	21.6	³ 2,245
Angola	(⁵)	(⁵)	(⁵)	(⁵)	(²)	(⁵)	(⁵)
Egypt	1.0	0.6	21.0	0.9	47.5	21	(⁷)
Libya	1.31	0.8	5.4	0.2	(⁸)	(⁵)	³ 28
Nigeria	3.51	2.3	13.4	0.5	(⁸)	(⁵)	³ 198
Middle East							
Iran	23.0	14.8	60.6	2.5	(⁸)	65.0	⁶ -99
Iraq	3.11	2.0	(⁵)	(⁵)	(⁵)	(⁵)	(⁵)
Kuwait	1.49	1.0	9.5	0.4	(⁸)	9.5	(⁷)
Oman	0.83	0.5	13.4	0.5	61.9	(⁵)	³ 87

See footnotes at end of table.

Table 3-2—Continued
Overview of major natural gas-producing countries: Selected market characteristics, 2001

	Proved reserves	Percent of world total	Production	Percent of world total	Projected duration of proved reserves¹	Consumption	Net trade²
	<i>Trillion cubic meters</i>		<i>Billion cubic meters</i>		<i>Years</i>	<i>Billion cubic meters</i>	<i>Billion cubic feet</i>
<i>Middle East—Continued</i>							
Qatar	14.4	9.3	32.5	1.3	(⁸)	16.0	³ 496
Saudi Arabia	6.22	4.0	53.7	2.2	(⁸)	53.7	(⁷)
United Arab Emirates ⁹ ..	6.01	3.9	41.3	1.7	(⁸)	34.3	³ 245
World total	155.1		2,464.0			2,404.9	

¹ Derived from the ratio of reserves to production. This figure represents the length of time, in years, that remaining reserves would last if production were to continue at current levels.

² Data on net imports and exports is for year 2000.

³ Data provided for exports only.

⁴ Calculated as production minus consumption and reported in billion cubic meters.

⁵ Not available.

⁶ No data reported for exports.

⁷ Available data indicate that the country consumes all the natural gas that it produces domestically.

⁸ Over 100 years.

⁹ The United Arab Emirates comprises seven states: Abu Dhabi, Ajman, Al Fujayrah, Ash Shariqah, Dubai, Ra's al Khaymah, and Umm al Qaywayn.

Source: BP, *The Statistical Review of World Energy*, June 2002, pp. 20, 22, and 25; and *International Petroleum Encyclopedia* (Tulsa, Oklahoma: PennWell, 2002), p. 231.

exchange for the rights to the resource, the private companies provided all investment capital and compensated the government with royalties and tax revenues from the sale of the oil. Over time, governments increased their direct involvement in an effort to capture greater value from the national resource. This drove the formation of national oil companies and, in several countries, the nationalization of the assets of foreign oil companies. As of 2001, 13 of the largest 20 oil companies in the world had some degree of state ownership (table 3-3).

The trend toward state control of hydrocarbon production began to reverse itself in the 1990s, as many countries questioned the wisdom of direct government management of the exploration and production process. As a result, the focus of government policy in a number of countries shifted toward encouraging private investment and management of operations, while retaining clear state control over the rights to natural resources. A brief description of such policy developments is presented in box 3-1, and typical contractual mechanisms for granting exploration and production rights to private companies are described in box 3-2.

Field Services Market

Demand for oil and gas field services depends largely on capital spending by exploration and production companies, which in turn is influenced by fluctuations in oil and gas prices.¹⁴ When prices rise, oil producers hire more contract drillers and field services providers to increase production from existing fields and explore for new resources. The resulting increase in production capacity ultimately pushes oil and gas prices down, thereby reducing demand for field services. In recent years, expenditures by U.S. firms on oil and gas field services have fluctuated widely. Standard and Poors estimates that U.S. capital spending increased by 23 percent and 46 percent in 1996 and 1997, respectively; was flat in 1998; fell by 24 percent in 1999; and jumped by 21 percent and 41 percent in 2000 and 2001, respectively.¹⁵

Demand for field services also depends on the relative maturity of oil and gas fields, as well as specific field characteristics. As fields mature, drilling activity declines and enhanced oil recovery services become more important. Since North American fields are increasingly viewed as mature, drilling activity is expected to shift toward less mature fields in South and Southeast Asia, Western Africa, and Russia.¹⁶ Because fields in the Middle East tend to be characterized by both high natural pressure and strong flow rates, drilling and enhanced oil recovery services are not expected to grow as rapidly as in the

¹⁴ Standard and Poors Industry Surveys, *Oil & Gas: Equipment and Services*, July 11, 2002, p. 7.

¹⁵ Global demand is difficult to quantify because many of the largest producers are state-owned oil companies that do not report capital spending figures. Capital spending by publicly held companies is assumed to be representative of total demand. Standard and Poors Industry Surveys, *Oil & Gas: Equipment and Services*, July 11, 2002, p. 7.

¹⁶ West Africa, Angola, and Nigeria are cited as promising markets. Norwegian industry officials, interview with Commission staff, Stavanger, Norway, Nov. 11, 2002; and British industry officials, meeting with Commission staff, London, England, Nov. 14, 2002.

Table 3-3
World's largest oil and gas companies, 2001

Country	Company	State ownership	Reserves		Output		Product sales
			Liquids	Gas	Liquids	Gas	
		Percent	Millions of barrels per day	Billion cubic feet	Millions of barrels	Billion cubic feet	Thousands of barrels per day
Algeria	Sonatrach	100.0	8,740	155,707	1,336	8,485	840
Brazil	Petrobras	92.5	8,356	8,440	1,324	1,447	2,215
China	PetroChina	90.0	11,032	32,533	2,091	1,381	1,126
France	TotalFinaElf	Public	6,960	20,705	1,433	3,758	3,109
Indonesia	Petamina	100.0	4,000	59,340	970	4,622	1,364
Iran	NIOC	100.0	89,700	812,300	3,787	5,858	1,283
Iraq	INOC	100.0	112,500	109,800	2,597	355	390
Italy	ENI	36.0	3,553	15,273	748	2,634	1,077
Kuwait	KPC	100.0	96,500	52,700	1,653	923	932
Mexico	Pemex	100.0	28,260	35,062	3,450	4,679	2,050
Nigeria	BBOC	100.0	13,500	74,400	1,312	639	260
Saudi Arabia	Saudi Aramco	100.0	261,698	213,300	8,602	4,580	2,983
Spain	Repsol YPE	Public	2,378	14,395	636	2,215	1,197
U.A.E	ADNOC	100.0	53,790	212,100	1,350	3,550	232
U.K.	British Petroleum	Public	7,643	43,918	1,928	7,609	5,510
U.K. & Netherlands	Royal Dutch/Shell	Public	9,751	56,283	2,274	8,212	5,574
U.S.	Chevron ⁽¹⁾	Public	5,001	9,552	1,159	2,469	1,418
U.S.	Exxon Mobil	Public	12,171	55,866	2,553	10,343	7,993
U.S.	Texaco ⁽¹⁾	Public	3,518	8,292	800	1,867	2,585
Venezuela	PDVSA	100.0	77,685	147,585	3,295	4,101	3,234

¹ Chevron Corp. and Texaco Inc. merged to form the Chevron Texaco Corporation in October 2001.

Note: Based on 2000 year-end operational results.

Source: Adapted from Standard & Poors Industry Surveys, *Oil and Gas: Production & Marketing*, Apr. 4, 2002, p. 7.

Box 3-1**Contracting process for oil and gas field services**

Much of the world's oil and natural gas resources are held by national governments. National governments often engage private international oil companies (IOCs) to explore for and produce oil and gas. The contract mechanism most widely used in countries with competitive oil and gas exploration and production markets is the concession. In countries with a state-owned, or national, oil company (NOC), private-sector firms are generally permitted to develop oil and gas resources under either a production sharing agreement (PSA), or production sharing contract (PSC). Finally, in countries where private-sector investment in the oil and gas sector is prohibited, private-sector entities enter into "service contracts" with the national oil company.¹

Concessions

The first concession agreements were long-term contracts which gave the concessionaire exclusive exploitation rights over large areas. More recent concessions are valid only for a well-defined geographic area and a specific period of time; and most of these agreements require the concessionaire to relinquish rights to explore and develop resources upon expiration of the agreement. The concession process begins with the government authority responsible for managing the exploitation of energy resources issuing a tender for a concession, whereby it solicits bids from competing oil companies to explore for and develop resources within a specified reserve area or block. Firms may bid independently for a concession, or collectively through participation in a joint venture or consortium. The concession holder maintains direct control over the management of the exploration and development process as well as all related investments. In exchange for the rights to explore and develop resources, the concession holder pays the government a combination of fees; royalties; and taxes on production, income, and/or profits. Royalties are often based on a sliding scale related to the level of production.²

Production Sharing Agreement or Contract

In countries with national oil companies, such as China and Indonesia, PSAs or PSCs appear to be the preferred mechanism for permitting private-sector firms to explore and develop oil and gas resources.³ PSAs and PSCs were developed to allow governments to play a greater role in the management and control of resource development but, as in the case of a concession, the private-sector partner is generally the operator. A PSA or PSC has three basic elements: cost recovery; a production split between the government and the contracting party; and taxes. Local governments usually require the establishment of joint ventures between private-sector firms and the national oil company. The contract generally affords the government a share of production equal to its share of equity investment, as well as tax revenues and royalties based on the private-sector partner's share of production. The contract may also protect the government from any equity risk until viable commercial discoveries are made, at which time the government exercises an option to participate in production.

Service Contract

In countries where private-sector investment is prohibited, such as Kuwait and Mexico, national governments control directly, or through state-owned enterprises, all access to oil and natural gas resources, and service contracts are the standard method for acquiring the expertise of foreign oil production companies.⁴ Under a service contract, a company is hired to provide a particular service, ranging from an individual task on a well to the entire exploration and/or development of an oil or gas field, and all the oil and gas produced is controlled by the producing country or NOC.

¹ Although these contracts are called "service contracts," many contain an investment element whereby the IOC provides up-front investment capital to develop the field, for which it will be compensated in the future through production earnings. As such, it is not clear whether these contracts would be considered service contracts or production contracts within the context of trade.

² Industry representative, telephone interview with Commission staff, Nov. 12, 2002.

³ Exploration/Production Agreement Structure, found at Internet address http://orc.pennnet.com/barrows/barrows_menu.cfm/, retrieved Aug. 15, 2002.

⁴ Service contracts are not exclusive to countries that prohibit private-sector investment, and are also reportedly used in Norway and Venezuela. *Exploration/Production Agreement Structure*, found at Internet address http://orc.pennnet.com/barrows/barrows_menu.cfm/, retrieved Aug. 15, 2002.

Box 3-2**Recent policy developments in selected markets****Algeria**

Passage of an important new hydrocarbon sector reform law was expected in May 2002 as part of a more general economic reform program ongoing since the 1999 presidential election, and the civil concord agreement which ended an extended civil war during the same year. According to government officials, the prospective new law on hydrocarbons is intended to increase competition in both upstream and downstream markets by eliminating the national oil company (Sonatrach's) de facto monopoly. Sonatrach will be forced to compete on commercial terms with private-sector oil companies, and its field services subsidiaries will also be subject to market competition. There have also been proposals to privatize several subsidiaries of Sonatrach, in order to raise funds for the government, and possibly to permit foreign firms to purchase shares of Sonatrach, although the Algerian Government is expected to remain the company's majority shareholder.

Argentina

Reform of the natural gas industry began in the late 1980s and resulted in the privatization of Yacimientos Petroliferos Fiscales, thereby remaining the government's exclusive rights in exploration and production. Argentina also has stimulated interest in exploration with a plan for competitive bidding for both onshore and offshore exploration licenses.

Brazil

Oil and gas sector reform began in 1995 with the removal of restrictions on equity participation by private firms. In 1997, the Brazilian government set limits on the federal government's holdings in Petrobras and created a new regulatory agency, Agência Nacional do Petróleo (ANP). ANP is responsible for the regulation, contracting, and oversight of commercial activities in the oil and gas sector. The 1997 changes also permitted private-sector firms to bid for the right to explore, develop, and produce oil and gas. Private-sector firms that are awarded such rights by the government enter into concession agreements with Petrobras.

Colombia

In July 2002, in an effort to increase foreign investment in Colombia's oil and gas sector, a new law was passed changing the formula for calculating royalties paid on production from small- and medium-sized oil fields. The new law replaces the former fixed-rate for royalties on oil production with a variable rate of 5 percent to 25 percent based on daily production volume. Other efforts to increase foreign investment in Colombia's oil and gas sector include revised laws on foreign currency exchange for foreign firms engaged in oil and gas exploration and development, and simplified environmental licensing procedures.

China

China abolished its energy ministry in 1993, and authority over the energy sector now rests with the State Development Planning Commission. A 1998 reorganization created two new state-owned oil companies: the China National Petroleum Corporation (CNPC), which operates in the north and west of China; and the China Petrochemical Corporation (Sinopec), which operates in the south and east. A third state-owned firm, the China National Offshore Oil Corporation (CNOOC) is responsible for offshore exploration and production. Chinese law requires that foreign firms providing upstream oil and gas services partner with CNPC, Sinopec, or CNOOC. In 2000 and 2001, CNPC, Sinopec and CNOOC sold minority equity shares in Hong Kong and New York.

India

In 1997, India introduced the New Exploration Licensing Policy, permitting foreign companies to engage further in oil and gas exploration. India recently announced that it is also establishing an Oil and Gas Regulatory Authority to oversee the industry and ensure competition. As of August 2002, most of the activity in the Indian oil and gas sector remained under the control of two state-owned enterprises, the Oil and Natural Gas Corporation Limited and Oil India Limited.

Indonesia

As a result of legislation passed in October 2001, the Indonesian Ministry of Mines and Energy is responsible for awarding and supervising production sharing contracts with foreign companies. Previously, this function fell under the authority of Pertamina, the national oil company. The new law was meant to address conflicts of interest at Pertamina by authorizing the establishment of separate agencies to implement and manage PSCs with private oil and gas companies, and to regulate the downstream distribution sector. The same legislation required that Pertamina reorganize itself into a limited liability company within two years, effectively ending its monopoly on upstream oil development.

Box 3-2--Continued**Recent policy developments in selected markets****Kazakhstan**

Following its independence in 1991, Kazakhstan opened its oil sector to investment by foreign companies. International projects have taken the form of joint ventures with Kazakhoil (now Kazmunaigaz), production sharing agreements (PSAs), and exploration/field concessions. In February 2002, a new national oil and natural gas company, Kazmunaigaz, was formed through the merger of the state-owned oil company, Kazakhoil, and the national oil and gas transportation firm, TransNefteGaz. The goal of the merger was to ensure the existence of unified national policy pertaining to the use of the country's mineral resources.

Libya

The Libyan Government is in the process of drafting new legislation aimed at attracting more foreign investment to the oil and gas industry, including upstream investment, but the details of the new law are not yet clear. The amendments under consideration include increased access to exploration acreage; small field development; large field incremental production opportunities; increased transparency; and the adoption of international competitive bidding practices.

Pakistan

Pakistan's Ministry of Petroleum and Natural Resources released new policy guidelines for onshore and offshore development in 2001. Both contained incentives intended to increase private sector involvement in the upstream oil and gas sector. Previous to the introduction of the new onshore and offshore policies for exploration and production, private-sector firms operated on concessions. The new policies require PSAs to be undertaken for all future projects, and will also allow existing concession holders to convert to a PSA at their own discretion. In addition, Pakistan's Privatization Commission identified the state-owned Oil and Gas Development Corporation (OGDC) as a candidate for privatization in 2002. The sale of a 51-percent equity stake in OGDC follows the tender of nine oil and gas production areas in April 2002.

Russia

Reform of Russia's oil and gas industry began in 1993, when state-owned enterprises were re-organized as joint-stock companies. The largest of these vertically integrated oil companies are Lukoil, Yukos, Surgutneftegaz, Tyumen Oil (TNK), Tatneft, and Sibneft. Since 1995, government shares of these companies have been sold to the private sector. In early 2002, the Russian Government decided to privatize an additional 5.9 percent of Lukoil. However, in August 2002 the Russian Federal Property Fund unexpectedly canceled the sale, despite bids that were reportedly well within the government's targeted price range. In 2001, Russia began restructuring Gazprom, the natural gas company in which the government has a 38-percent equity stake. A new government resolution calls for Gazprom's upstream operations to be split into separate production companies, thereby encouraging competition in Russia's natural gas market. Although Russia's current political and economic stability has improved the country's investment climate, foreign investment in the oil and gas industry remains relatively low. The Russian Government is reportedly in the process of amending tax codes and laws pertaining to PSAs in an effort to raise investment in the oil and gas industry.

Venezuela

In 1995, the Venezuelan Government began opening the country's oil and gas industry to foreign investment, allowing private-sector firms to invest in the exploration and production of light and medium crude oil. However, in 1999, the government curtailed foreign investment in the oil industry, indicating that no new oil exploration and production licensing rounds would be held but that existing contracts would be honored. Subsequently, a 1999 law created a licensing system for the exploration of nonassociated gas, established a regulatory body to oversee the natural gas sector, and established a regulated pricing system. Finally in 2001, Venezuela introduced a new hydrocarbons law which reserves most oil activities for the state, but allows private participation through joint ventures in which the national oil company, Petroléos de Venezuela S.A. (PDVSA) retains a 51-percent equity stake. The law does not apply to exploration and production of nonassociated natural gas, which is still governed by the 1999 gas law. The 2001 law increases royalty payments from 16.6 percent to 30 percent, with the understanding that the rate may be lowered to 20 percent if mature or extra heavy crude oil fields are not proven to be economically viable. The law stipulates that private-sector participation is permissible only through joint-venture arrangements.

Source: Compiled by the U.S. International Trade Commission from various sources, including the U.S. Department of Commerce; the U.S. Department of Energy; U.S. Department of State cables; industry trade journals; and interviews with industry representatives.

aforementioned regions. Nevertheless, the Middle East will remain an important source of demand for oil and gas field services due to its enormous reserves.¹⁷

Competition to supply oil and gas field services is strongly influenced by technological and financial resources. Firms possessing technology that affords improved identification or enhanced recovery of oil and gas resources are able to offer their customers greater production levels at lower costs.¹⁸ Some key technologies were discussed in chapter 2. These include horizontal drilling and seismic imaging and analysis. Promising technologies still under development include seismic surveys from airplanes and low-cost microdrilling systems. Access to state-of-the-art technologies requires adequate financial resources because research to develop new technology is expensive and time consuming.

In the contract drilling segment, competition also appears to be influenced by location advantages. Firms operating rigs in a particular region generally are able to relocate them to new production sites in that region, or construct new rigs on-site, more rapidly and at lower cost than firms without current operations in that region.¹⁹ The underlying cost of production in a given region may also confer competitive advantages on firms operating there. For example, due to more favorable weather conditions and shallower water, it is generally less costly to extract oil from fields in the Gulf of Mexico than in the North Sea, yielding wider profit margins for firms producing in the Gulf. Consequently, when oil prices fall, production is more likely to be curtailed first in the more costly North Sea, while firms servicing fields in the less costly Gulf of Mexico may continue to operate.²⁰

Nature and Extent of Trade

The General Agreement on Trade in Services (GATS) defines four modes of supply through which international trade in services can occur: (1) cross-border supply, (2) consumption abroad, (3) commercial presence, and (4) presence of natural persons. Modes 1, 3 and 4 are relevant to the oil and gas field services industry.²¹ An example of a mode 1 activity would be analysis of geological data by a firm in the United States on behalf of a client firm located elsewhere. Mode 3 activities would include those undertaken by foreign affiliates of U.S. firms. Specialized drilling crews that serve foreign markets would fit under the rubric of mode 4.

A comprehensive assessment of the nature and extent of trade in field services through mode 1, cross-border supply, is not possible due to limited data availability. In U.S. cross-border trade data, oil and gas field services cannot be separated from the larger reported category of construction, engineering, architectural, and mining services, which recorded total exports of \$2.6 billion in 2001 and total imports of \$471 million. Since the

¹⁷ Ibid.

¹⁸ U.S. industry representatives, interviews with Commission staff, Houston, Texas, Oct. 8-10, 2002.

¹⁹ The location advantage is mitigated somewhat in the offshore segment, however, as it is less costly to move offshore rigs.

²⁰ Norwegian industry representatives, interviews with Commission staff, Stavanger, Norway, Nov. 11, 2002.

²¹ Peter C. Evans, "Strengthening Multilateral Disciplines for Trade in Energy Services," mimeo, MIT, Mar. 26, 2002.

global market for oil and gas field services is estimated to be about \$100 billion,²² it appears that cross-border supply accounts for a smaller proportion of trade in field services than does mode 3, commercial presence.

This inference is supported by official data on commercial presences.²³ Table 3-4 reports assets, total sales, and sales of services, by country, for oil and gas field services affiliates of U.S. non-bank parents. U.S. oil and gas field services firms participate in every major market in the world, through both onshore and offshore operations. Total sales of oil and gas field services through U.S. affiliates were \$8.6 billion in 1998, the most recent year for which data are available. The largest markets for U.S. service providers were Europe and Latin America, followed by the Asia Pacific region and Africa. Within Europe, U.S. firms have been most active in the North Sea region, with most affiliate sales and investment by U.S. firms taking place in the United Kingdom, the Netherlands, and Norway. In Latin America, U.S. firms appear to have been most active in Venezuela, Brazil, and Mexico. The largest markets in the Asia Pacific region are Australia and Indonesia.²⁴

The predominance of affiliate sales is borne out by examining the international operations of field service providers. Such a review reveals that most services are provided through foreign affiliates located in or near oil producing regions. For example, Baker Hughes provides specialized technology for six drilling projects on the U.K. Continental Shelf through its U.K.-based affiliate.²⁵ In the Netherlands, Halliburton provides well development and completion services, such as wellsite formation correlation chemostratigraphy and downhole well testing,²⁶ GeoQuest, a subsidiary of Schlumberger, provides geoscientific evaluation services,²⁷ and Weatherford provides tubular running services as well as fishing and downhole services through its Dutch subsidiary, Weatherford Oil Tool Nederland B.V.²⁸

²² Standard & Poor's Industry Surveys, *Oil and Gas: Equipment and Services*, July 11, 2002, p. 7.

²³ See U.S. Department of Commerce (USDOC), Bureau of Economic Analysis (BEA), *U.S. Direct Investment Abroad: Operations of U.S. Parent Companies and Their Foreign Affiliates* (revised 1998 estimates), Feb. 2002.

²⁴ U.S. foreign direct investment data for oil and gas field services in 2001, published by the Bureau of Economic Analysis (BEA), was used to inform the discussion on the largest markets for investment by U.S. oil and gas field services firms. USDOC, BEA, *Survey of Current Business*, Sept. 2002, pp. 77 and 95.

²⁵ Baker Hughes, North Sea/UK Sector - Operational Experience, found at Internet address <http://www.bakerhughes.com/>, retrieved on Aug. 27, 2002.

²⁶ Halliburton, "Halliburton and Chemostrat Introduce the Industry's First Wellsite Formation Correlation Chemostratigraphy Service," press release found at Internet address <http://www.halliburton.com/>, retrieved Aug. 28, 2002, and Halliburton, "Halliburton Performs World's First Downhole Well Testing Wireless Data Acquisition Project," found at Internet address <http://www.halliburton.com/>, retrieved Aug. 28, 2002.

²⁷ "NAM Selects GeoQuest as Subsurface Evaluation Software Provider," found at Internet address <http://www.sis.slb.com/>, retrieved Aug. 28, 2002.

²⁸ Netherlands Offshore Catalogue 2002, "Weatherford - Company Profile," found at Internet address <http://www.nsi-noc.com/>, retrieved Sept. 5, 2002.

Table 3-4
Oil and gas field services: Sales by foreign affiliates of U.S. companies by country, 1998

	Assets	Sales	Sales of services
	———Millions of U.S. dollars———		
Canada	(1)	578	557
Europe ² (total)	4,533	2,829	2,780
France	(1)	(1)	(1)
Germany	(1)	(1)	(1)
Netherlands	1,359	539	534
United Kingdom	1,906	1,617	1,581
Other	(1)	(1)	(1)
Latin America ³ (total)	4,227	2,728	2,643
Brazil	713	244	244
Mexico	406	300	293
Other	3,108	2,184	2,106
Africa	1,277	613	606
Middle East	(1)	558	555
Asia and Pacific (total)	1,945	692	692
Australia	271	(1)	159
Japan	15	5	5
Other	1,659	(1)	528
International ⁴	2,707	815	815
World	16,393	8,812	8,649

¹ Suppressed to avoid disclosure of individual company data.

² Includes members of the former Soviet Union.

³ Western Hemisphere, other than Canada and the United States.

⁴ Pertains to operations in international waters.

Source: USDOC, BEA, *U.S. Direct Investment Abroad: Operations of U.S. Parent Companies and Their Foreign Affiliates*, Feb. 2002, pp. 55 and 75; and USITC calculations.

Foreign affiliates are similarly engaged in Latin America. In Venezuela, the largest oil and gas field service market in the region,²⁹ Halliburton provides energy services, as well as construction and engineering services, through its subsidiary, Kellogg, Brown & Root. Schlumberger provides various services, including operating an oil field for Petróleos de Venezuela, S.A. (PDVSA).³⁰ In Brazil, Baker Oil Tools, a subsidiary of Baker Hughes, installed a remote-controlled all-electronic well system in the deep-water Campos Basin

²⁹ USDOC, BEA, *Survey of Current Business*, Sept. 2002, pp. 77 and 95.

³⁰ USDOE, EIA, "An Energy Overview of Venezuela," found at Internet address <http://www.eia.doe.gov/emeu/cabs/venez.html>, retrieved on Sept. 9, 2002.

for state-owned Petrobras;³¹ Pride International (U.S.) owns and operates two deepwater semisubmersible drilling rigs;³² Schlumberger provides project management, engineering, construction, and other related services;³³ and Weatherford International provides drilling and well installation services.³⁴

The pattern of affiliate activities extends around the world into the Asia Pacific region, Africa, and the Middle East. Halliburton maintains approximately 30 offices in Australia and provides a range of services through subsidiaries Kellogg, Brown & Root and Sperry-Sun.³⁵ Smaller, more specialized oil and gas field services providers, such as drilling services firm Atwood Oceanics (U.S.), also operate through affiliates in Australia as well as in Indonesia.³⁶ In Algeria, Halliburton recently won an 8-year contract to provide Enhanced Oil Recovery services in the Hassi Messaoud Oil Field.³⁷ French firm Technip-Coflexip won a contract from ExxonMobil in July 2002 to provide turnkey management services at a production site in Angola. Bardex Corp. (U.S.) and Pride International are also in Angola providing hydraulic rig skidding and clamping systems to ExxonMobil.³⁸ In Libya, a consortium consisting of Bouygues Offshore (France), Stolt Offshore (U.K.), and Rosbos (a joint venture between Bouygues and Italian firm, Rosetti) is building a \$54-million offshore oil platform for Compagnie Des Petroles Total Libye.³⁹

A likely explanation for the predominance of affiliate sales over cross-border transactions is that hydrocarbon production tends to take place over a long period of time and within relatively concentrated regions. Oil-rich regions tend to be productive for decades. For example, the development of oil fields in the Caspian Sea region began in 1873 and continues well over a century later.⁴⁰ Meanwhile, the relatively young North Sea and Alaska fields are entering their fourth decade of production. For service firms, this long production cycle suggests that the optimal organizational approach is to establish regional affiliates, which are then positioned to compete for contracts on a long-term basis.

³¹ Baker Hughes, "Baker Oil Tools Installs World's First Remotely Controlled All-Electronic, Multizone Intelligent Well System for Petrobras," company news, Sept. 7, 2001, found at Internet address <http://www.bakerhughes.com/>, retrieved Sept. 19, 2002.

³² Pride International, "Pride International Reports Quarterly Results," company news, July 25, 2002, found at Internet address <http://www.prideinternational.com/>, retrieved Aug. 23, 2002.

³³ Schlumberger Limited, "Campos Basin Floating Dewatering Facility Completed Under Budget," company news, found at Internet address <http://www.slb.com/>, retrieved Aug. 21, 2002.

³⁴ Ibid.

³⁵ Halliburton press releases and corporate information, found at Internet address <http://www.halliburton.com/>, retrieved Nov. 4, 2002.

³⁶ Atwood Oceanics, corporate information, found at Internet address <http://www.atwd.com/>, retrieved Nov. 5, 2002.

³⁷ U.S. Department of State telegram, "An Auspicious Beginning for Algeria's American Chamber of Commerce," message reference No. 00206, prepared by U.S. Embassy, Algiers, Jan. 31, 2002.

³⁸ "In Brief," *Hart's European Offshore Petroleum*, June 2, 2002, found at Internet address <http://www.proquest.umi.com/>, retrieved Aug. 15, 2002.

³⁹ *International Petroleum Encyclopedia* (Tulsa, Oklahoma: PennWell, 2002), pp. 123-124.

⁴⁰ Daniel Yergin, *The Prize*, p. 789.

CHAPTER 4

EXTENT OF IMPEDIMENTS TO TRADE AND POTENTIAL BENEFITS OF LIBERALIZATION

Extent of Impediments to Trade

The impediments to trade in oil and gas field services most frequently encountered by international oil and gas field service providers include poor transparency, specific labor requirements, joint-venture requirements, limitations on foreign investment, and technology transfer requirements. An important characteristic of these measures is that they are not uniquely applied to the energy sector, but rather are endemic to services trade in general. Despite the existence of such impediments, it is unusual to find that foreign field service providers are precluded altogether from entering upstream oil and gas field services markets. This is because few countries endowed with energy resources have the domestic capability to provide all field services internally. In order to bring their oil and gas resources to the global market at competitive prices, some degree of foreign participation usually is necessary.

Transparency

The central issue of transparency is the manner in which governments carry out their legislative and regulatory procedures. Policy regimes with a high degree of transparency ensure that all market participants and the public at large have access to information on regulations, procedures, and other measures that affect their interests as well as the ability to comment on new policy proposals.¹ By contrast, regimes with poor transparency are characterized by sudden and unpredictable changes in policies such as licensing requirements and tax laws. This uncertainty imposes additional costs on market participants and degrades the general business environment. In addition, poor transparency can provide a mask for corruption, as a system of unwritten rules provides more opportunities for officials to exploit their public authority for private gain. Oil and gas field service providers have indicated that problems with transparency are widespread as relatively few of the major oil producing countries have a robust system of providing policy information to the public and permitting opportunities for comment. Specific regions where transparency reportedly poses a particular challenge include much of the former Soviet Union, West Africa, China, Brazil, and Indonesia.²

¹ WTO, Council for Trade in Services, Special Session, "Communication from the United States: Transparency in Domestic Regulation," S/CSS/W/102, July 13, 2001, found at Internet address <http://www.wto.org/>, retrieved Nov. 12, 2002.

² U.S. industry representatives, interviews with Commission staff, Houston, Texas, Oct. 8-10, 2002.

Labor Requirements

Specific labor requirements present another impediment to the field service sector. The award of field service contracts is sometimes contingent on local labor requirements, which may specify that foreign firms staff operations with a certain number or proportion of local workers.³ The extent to which such policies impose a significant impediment varies depending upon the specific nature of the measures. In many cases, foreign firms prefer to staff as many positions as possible with local personnel because indigenous staff have a deeper knowledge of the operating environment and usually are less costly than expatriate personnel. Consequently, a local hiring requirement may not actually impose a constraint. However, measures that are more intrusive can adversely affect the ability of foreign firms to manage overseas operations.⁴ For example, regulations in Saudi Arabia require that nationals be hired to perform specific occupations, and the list of these occupations keeps growing longer. In addition, Saudi Arabia stipulates that firms with more than 20 workers must initially reserve a minimum of 5 percent of available positions for Saudi nationals and thereafter increase this percentage by 5 percent annually.⁵

Joint-venture Requirements and Investment Limitations

In some countries, joint-venture requirements are imposed on foreign oil and gas field services firms. As with local hiring, firms may in some instances prefer to establish as joint ventures to assist in navigating through local customs and regulations. However, joint venture requirements, like some labor requirements, can adversely affect international operations and the competitive landscape. The Chinese Government, for instance, requires certain services to be performed in joint ventures with Chinese firms and retains the right to approve the location of the foreign firm's branch, subsidiary, or representative office.⁶ In certain other markets, such as Saudi Arabia, joint ventures with majority national ownership receive preference in government contracts and favorable tax treatment.⁷

Technology Transfer Requirements

Technology transfer requirements are also a significant concern of international field service companies. Such requirements often are imposed as a criteria for winning service contracts. For example, in Russia, the opportunity to provide services on specialized wells reportedly may be conditioned on the level of access to technology

³ Ibid.

⁴ Ibid.

⁵ Firms failing to comply with the regulations would be unable to obtain visas for expatriate workers. U.S. State Dept. of State telegram, "2002 Investment Climate Statement: Saudi Arabia," message reference No. 0349, prepared by U.S. Embassy, Riyadh, July 25, 2002.

⁶ USDOC, Market Access and Compliance, "Oil-Field Services," Dec. 2001, found at Internet address <http://www.mac.doc.gov/China/Docs/industryfactsheets/oil-fieldservices.html/>, retrieved Aug. 13, 2002.

⁷ USDOC, U.S. Commercial Service, "Saudi Arabia Country Commercial Guide, 2002," found at Internet address <http://www.usatrade.gov/>, retrieved Aug. 15, 2002.

that is provided to local Russian firms.⁸ Joint venture requirements provide another implicit means of imposing technology transfer, as the local partner is likely to garner at least some level of access to the technology of the foreign partner. For example, China's mandatory joint ventures may cause an operator in charge of drilling and development under a turnkey contract with a foreign oil firm to share plans on well design among numerous entities.⁹ Less coercive measures to bring about technology transfer include those developed by Venezuela where bids for contracts with the national oil company must include a proposal for developing local capacity.¹⁰

Movement of Equipment Issues

Limitations on the movement of equipment used in the provision of oil and gas field services appear to be important in several developing-country markets. Numerous countries levy high duties on equipment that is imported into a country for a brief period and then re-exported to another country, such as specialized cement pumping trucks used in well completion. In Brazil, the duty differential on re-exported equipment as compared with equipment remaining in Brazil reportedly is substantial.¹¹ In India, field service firms report that frequent changes in customs regulations create compliance problems, resulting in prolonged impoundment of equipment after completion of projects. Foreign firms reportedly pay costly multimillion-dollar customs duties in India, assessed as a percentage of the total value of the equipment, until regulatory compliance is satisfied.¹²

Trade Sanctions

Trade sanctions may preclude field service firms from doing business in several Middle Eastern countries. U.S. sanctions imposed on Libya in 1986 prevent U.S. firms from operating in that market, although similar United Nations (U.N.) sanctions were lifted in 1999.¹³ Executive orders signed in 1995 and 1997 by President Clinton prohibit U.S. firms and their subsidiaries from conducting business in Iran. Moreover, the U.S. Iran-Libya Sanctions Act imposes sanctions on non-U.S. firms that invest more than \$20 million annually in the Iranian crude petroleum and

⁸ U.S. industry representatives, interviews with Commission staff, Houston, Texas, Oct. 8-10, 2002.

⁹ Ibid.

¹⁰ Andean Development Corporation (La Corporación Andina de Fomento), Latin American Energy Organization (la Organización Latinoamericana de Energía), Inter-American Development Bank, and UNCTAD, "Informe Preliminar a los Presidentes de los Países Andinos Sobre: El Potencial Energético de la Subregión Andina como Factor Estratégico para la Seguridad Energética Regional y Hemisférica," July 2002, p. 45.

¹¹ U.S. industry representatives, interviews with Commission staff, Houston, Texas, Oct. 8-10, 2002.

¹² U.S. industry representative, telephone interview with Commission staff, Sept. 25, 2002.

¹³ The Libyan Sanctions Regulations, Title 31 Part 550, U.S. CFR, were authorized under the International Emergency Economic Powers Act and the International Security and Development Cooperation Act of 1985, "Libya: What You Need to Know About the U.S. Embargo," U.S. Department of the Treasury, Office of Foreign Assets Control, found at Internet address <http://www.ustreas.gov/>, retrieved Sept. 3, 2002.

natural gas industries. Other limitations include U.N. sanctions against Iraq, under which revenues from Iraqi oil exports must be used solely to purchase humanitarian supplies for distribution in Iraq and to compensate Gulf War victims.¹⁴

Other Impediments

Other impediments affecting foreign field services firms include requirements that a local agent be used to represent the local operation, a practice common in Middle Eastern markets such as Qatar, Saudi Arabia, and the United Arab Emirates. Reportedly, field service firms face difficulties in some markets in obtaining timely issuance of visas or work permits or acceptance of credentials of expatriate engineers and other specialists, or must demonstrate to competent authorities that necessary expertise is not sufficiently available locally. In addition, many markets, including Brazil, Canada, Indonesia, Venezuela, and the United States, maintain cabotage restrictions¹⁵ that may affect the operations of foreign providers of offshore services that entail maritime transportation.¹⁶

Potential Benefits of Trade Liberalization

According to economic analyses, there are three primary benefits of trade liberalization in oil and gas field services. First, there are the traditional gains that accrue to countries that specialize in the goods and services for which they have a comparative advantage.¹⁷ Second, downstream petroleum markets may benefit from an overall reduction in the cost of extraction. Downstream benefits may accrue to both petroleum producers and consumers. Decreased extraction costs expand the wealth of petroleum-producing countries by decreasing the outlays required to bring their natural resources to world markets, and benefit petroleum-importing countries by increasing supply and possibly reducing world petroleum prices.

The third primary benefit stems from knowledge spillovers that could potentially accrue to future operations in oil and gas field services. Essentially, expansion of the industry into new projects facilitates learning. This newly acquired knowledge will likely have applications to other projects. Ultimately such knowledge will reduce

¹⁴ For further information on sanctions, see U. S. International Trade Commission, *Overview and Analysis of Current U.S. Unilateral Economic Sanctions (Investigation No. 332-391)*, USITC publication 3124, August 1998.

¹⁵ Cabotage refers to the transportation of goods between the ports of a country, either directly or via a third-country port. For more information about U.S. laws in this regard, see U. S. International Trade Commission, *The Economic Effects of Significant U.S. Import Restraints, Third Update 2002 (Investigation No. 332-325)*, USITC publication 3519, June 2002, ch. 5. See also U.S. Department of Transportation (USDOT), Maritime Administration (MARAD), *By the Capes Around the World: A Summary of World Cabotage Practices*, found at Internet address <http://www.marad.dot.gov/publications/pubs.htm/>, retrieved Nov. 27, 2002.

¹⁶ Norwegian industry representatives, interviews with Commission staff, Stavanger, Norway, Nov. 11, 2002.

¹⁷ For a more complete discussion of comparative advantage see Paul R. Krugman and Maurice Obstfeld, Ch. 2, *International Economics: Theory and Policy*, 6th ed. (New York: Addison-Wesley, 2002).

overall industry costs. Each of these potential benefits of trade liberalization is discussed below in further detail, followed by an examination of the cost and benefit trade-offs presented by the major impediments that have been identified.

Gains through Comparative Advantage in Oil and Gas Field Services

International trade theory is founded on the efficiency advantages available when markets allocate production to those with relatively lower costs. In general, countries gain when they specialize in production of goods in which they have a comparative advantage. Restrictions that limit trade in goods and services limit the gains available from more efficient suppliers. Traditional gains available through lower-cost service provision are evidenced in the marketing activities of oil and gas field services providers. Firms attract business by indicating that they will reduce capital and operating costs, and increase reserves and production. Furthermore they highlight their expertise in performing specialized tasks, as well as their superior safety and performance records.¹⁸

The fundamentals of comparative advantage also indicate that impediments to trade in goods and services will misallocate resources in both the exporting and importing countries. In general, trade restrictions will cause the potential exporter to devote too few resources to oil and gas field services, and will cause the potential importer to devote too many resources to oil and gas field services. The trade restriction prevents each country from realizing the gains from specializing in the good or service that they might produce at a relatively lower cost or higher quality.

Impact of Liberalization in Oil and Gas Field Services on Downstream Markets

Reducing the cost of bringing oil and natural gas to market through liberalization of oil and gas field services will likely generate downstream benefits.¹⁹ From an aggregate world perspective, oil and gas reserves have a value that is determined by computing the net present value of their expected contributions to future production and consumption. Exploration, extraction, and other field services costs, combined with equipment and transportation costs, act to reduce the total value of the resource. One can think of these costs as a portion of world petroleum resources used to bring the oil and gas reserves to market. Efficiency gains, through liberalization in oil and gas field services, reduce the real resources used, increasing the net value of oil and gas reserves.

¹⁸ U.S. industry representatives, interviews with Commission staff, Houston, Texas, Oct. 8-10, 2002.

¹⁹ According to energy analysts, world production markets are sufficiently competitive such that a reduction in the costs associated with petroleum exploration and production is likely to reduce oil prices. A fundamental tenet of welfare economics is that consumers of downstream petroleum products will in turn benefit from lower prices of oil. USDOE, EIA, *International Energy Outlook 2001*, p. 26. See also Angus Deaton and John Meullbauer, *Economics and Consumer Behavior*, (Cambridge, MA: Cambridge University Press, 1991).

The net gain in the value of oil and gas reserves can be divided into gains to resource owners (petroleum-exporting countries) and resource consumers (petroleum-importing countries). Resource owners gain directly by cost reductions that increase the value of their oil and gas reserves. Furthermore, reduced extraction costs are likely to expand the number of economically viable fields, as marginal fields are brought into production. Overall, either through reduced costs of extraction from previously viable fields or through extraction from fields that would not be profitable without the cost reductions, the value of oil and gas resources increases under liberalization, thereby benefitting the owners of those resources.

Consumers of oil and gas might also gain from increased production efficiency. In the absence of a significant, coordinated effort by producers to limit supply, consumers of oil and gas will benefit through lower prices.²⁰ Reduced extraction costs make the extraction of petroleum more profitable at a given petroleum price. Under competitive conditions, supply expands and market prices fall. From a global perspective, a reduction in the resources used to bring oil and gas to market, generated by liberalization of oil and gas field services, increases consumer welfare.

Potential Gains from Technological Spillovers

In addition to the traditional gains from trade through comparative advantage, and their subsequent impact on downstream petroleum markets, it is likely that additional gains are attainable by expanding the oil and gas field services industry through trade liberalization. Generally, these additional gains might be attributed to technology or knowledge spillovers.²¹ The highly differentiated segments of the oil and gas field services industry use a substantial degree of specialized knowledge and equipment. At first, when these innovative and specialized services or equipment are supplied, they command a premium over standard techniques, but over time competitors often find it advantageous to adopt the innovations. Overall, one might expect the cost of providing field services to fall or the quality of the provided service to increase as a result of the dissemination of advanced technology or knowledge.

Different segments of the oil and gas field services industry might be characterized by different spillovers, and these will interact with policy in different ways. For example, if a firm is to develop innovative technologies for application in foreign countries, it may want assurances from foreign governments that its proprietary knowledge is not rapidly transferred to its competitors. Field services firms that are interested in protecting their proprietary technologies are likely to desire a commercial presence (mode 3 under the GATS) in the importing country to maintain

²⁰ According to energy analysts, world petroleum markets are forecasted to remain highly competitive despite OPEC's efforts to increase prices. USDOE, EIA, *International Energy Outlook 2001*, p. 26. See also David M. Kreps, *A Course in Microeconomic Theory*, (Princeton, NJ: Princeton University Press, 1990).

²¹ For example, participation by foreign firms in Norway's oil and gas field services market is reportedly encouraged in order for the local industry to be able to access these firms' technology and specialized expertise. Norwegian Government Officials, interviews with Commission staff, Stavanger, Norway, Nov. 11, 2002. For a general discussion of spillovers and technology in the context of international trade see Gene M. Grossman and Elhanan Helpman, "Technology and Trade" in *Handbook of International Economics*, vol. III, edited by G. Grossman and K. Rogoff (New York: Elsevier Science B.V., 1995).

some level of control over the diffusion of their technologies. Consequently, countries intending to benefit from recent technological innovation must be sensitive to intellectual property and foreign direct investment issues.

In addition, the greater the scope of the industry, the more available general knowledge is about how to provide oil and gas field services efficiently. As noted in chapter 2, the use of advanced exploration techniques has improved the historical success rate of exploring wildcat wells from about one-in-five to one-in-three. Such advances are attributable to knowledge acquired directly through the process of exploration. Therefore, the more oil and gas exploration that is performed, the greater the number of innovations made in exploratory techniques. These innovations, in turn, facilitate greater efficiency in future exploration projects. Similar processes also characterize many segments of the oil and gas field services industry. To the extent that trade liberalization expands activity in this industry, it is likely that technology spillovers will also enhance the efficiency gains resulting from liberalized trade.

Effects on Overall Industry Competition

A general proposition in international trade theory is that trade restrictions concentrate market power by reducing market size.²² This in turn propagates anticompetitive conditions as markets with fewer participants may be subject to less pressure to reduce costs and improve quality. For example, trade impediments such as poor transparency confer an advantage on those firms that have the resources to track developments in multiple countries and negotiate directly with government agencies or state enterprises. Thus trade impediments would tend to support the competitive position of large, well established firms and discourage competition from new entrants. By contrast, removal of trade impediments may allow a broader range of firms to compete directly in foreign markets. In addition to expanding the overall size of the market, these new entrants may also enhance efficiency and drive costs down by competing more vigorously for service contracts throughout the exploration and production process. Nevertheless, not all of the competitive advantages of large integrated service providers are influenced by trade restrictions. In particular, given their experience in arranging for and managing contracted work carried out by smaller firms, it is likely that even with the removal of trade impediments, large integrated field service firms will continue to play an important role in securing international field services contracts.

Trade-offs of Trade Impediments

As described above, five major types of impediments have been identified: poor transparency, specific labor or hiring requirements, joint-venture requirements, foreign investment limitations, and technology transfer requirements. The juxtaposition of these impediments with the efficiency gains and cost savings achieved by liberalization suggests that the trade impediments impose costs that are borne by countries where they are imposed, countries that export restricted services,

²² For a general discussion on the procompetitive gains from trade, see Markusen, et al., *International Trade: Theory and Evidence*, ch. 11, (Boston, MA: McGraw Hill, 1995).

and countries that consume petroleum products. Thus, essentially all countries are adversely affected to some degree by the presence of trade restrictions.

However, with the exception of poor transparency, which does not appear to provide any economic benefits, some argue that the costs of these restrictive policies may be partially offset by gains that accrue to the producing country from the development of local capacity.²³ For example, although local hiring requirements impose a cost, they also may result in the development of a more skilled workforce which offers future benefits to the local economy. Similarly, the costs of joint-venture requirements, foreign investment limitations, and technology transfer requirements may be offset by long-term economic gains that result from the development of local industry.

The experience of Venezuela has been used to illustrate this point. Oil was first discovered in Venezuela in 1922, but by 1980 only 25 Venezuelan engineering firms had been established, which tended to be small companies that provided consulting services for civil engineering works like highways and bridges.²⁴ The vast majority of oil and gas field services continued to be provided by foreign companies. Although Venezuela clearly benefitted from the wealth generated through oil production, these benefits were not translated into sustainable economic development in the form of a vibrant and competitive oil field service sector. Beginning in 1980, 5 years after Venezuela nationalized its petroleum industry, the national oil company, *Petróleos de Venezuela (PDVSA)*, began implementing a policy to support national capacity in integrated engineering services. This policy involved directing service contracts to local and joint-venture companies. Selection of contractors was linked to the prospects for development of local technical capacity, and elements considered included training opportunities and the potential for technology transfer. This policy is credited with increasing the number of engineering firms to 140 by the year 2000 and with the expansion of domestic capability to cover all specialties, provide fully integrated services, and even export services to Argentina, Colombia, Ecuador, and Panama, among others.²⁵

The argument that trade impediments can be used to support the development of infant industries asserts that, in developing countries, a temporary trade restraint will reduce competition from imports and enable an infant domestic industry to learn how to produce in such a way as to be internationally competitive in terms of cost and quality.²⁶ To extend the argument to field services, a joint-venture requirement imposed on foreign firms essentially guarantees a portion of the market for local companies in hopes that they will learn from doing and from their association with

²³ Representatives of the Venezuelan Government and the United Nations Conference on Trade and Development (UNCTAD), interviews by USITC staff, Geneva, Switzerland, Dec. 5 and Dec. 6, 2002.

²⁴ Andean Development Corporation (La Corporación Andina de Fomento), Latin American Energy Organization (la Organización Latinoamericana de Energía), Inter-American Development Bank, and UNCTAD, "Informe Preliminar a los Presidentes de los Países Andinos Sobre: El Potencial Energético de la Subregión Andina como Factor Estratégico para la Seguridad Energética Regional y Hemisférica," July 2002, p. 45.

²⁵ *Ibid.*

²⁶ Peter H. Lindert and Charles P. Kindleberger, *International Economics* (Homewood, Illinois: Richard D. Irwin, Inc., 1982), p. 145.

the foreign partner. Additional benefits could be derived from access to the technology and investment capital of the foreign partner. The infant industry argument could be appealing to governments which, after all, must act to balance political pressures, of which efficiency enhancement is only one element. However, trade restrictions are blunt instruments for achieving policy objectives and, once enacted, they are difficult to remove because the protected industry will fight hard to preserve its preferred status. For these reasons, more targeted forms of assistance are generally favored by economists, such as direct subsidies or incentives.²⁷

In considering the impediments that affect oil and gas field services, the question must be asked whether coercive policies concerning hiring, the selection of business partners, the control of establishments, and the transfer of technology are the best means of achieving the desired objectives. With respect to hiring requirements, companies interviewed for this study indicated a very high willingness to engage local personnel to the greatest extent possible. Maintaining expatriate staff is very expensive and local personnel offer much deeper knowledge of the operating environment. However, industry representatives also point out that oil and gas field operations are dangerous and that safety may be compromised by inexperienced staff. For this reason, they object to arbitrary staffing requirements mandated by either law or regulation because this does not offer sufficient flexibility.²⁸

International companies have similar views concerning joint-ventures. Voluntary joint ventures are sometimes considered to be a highly desirable way of entering and operating in foreign markets. But joint-venture requirements are considerably more problematic. Industry representatives report that, in some markets, there simply are not enough qualified firms with which to establish a credible partnership.²⁹ This can lead to a situation where relatively few entities can build large conglomerates by entering into multiple joint ventures, which may be counterproductive to other policy objectives, such as enhancing small- to medium-sized enterprise development. Mandated joint ventures also have been found to have a higher rate of dissatisfaction and instability within 3 years of start up than those that are undertaken spontaneously.³⁰

The impediments that receive the strongest negative reaction from international companies are foreign investment limitations, particularly those that limit foreign investment to less than 51 percent, and technology transfer requirements. Ultimately, these policies get to the issue of control of the firm and its proprietary technology, which is central to the competitiveness and profitability of the enterprise. When faced with such policies, there is some evidence that firms adapt the technology deployed and constrain their interactions with the local partner in order to preserve control over their most valuable assets. For example, technology transferred to joint ventures has been found to be older and less rapidly upgraded than that transferred to wholly-owned subsidiaries.³¹ As a result, policies that undermine the control of

²⁷ Ibid.

²⁸ Industry representatives, interview by USITC staff, Washington, DC, Nov. 13, 2002.

²⁹ Ibid.

³⁰ Theodore H. Moran, *Foreign Direct Investment and Development* (Washington, DC: Institute for International Economics, Dec. 1998), p. 9.

³¹ Ibid.

investments and technology may impede the dissemination of state-of-the-art technology and deter investment.

In light of the drawbacks of trade restrictions, other policies that provide foreign firms with greater flexibility may merit stronger consideration. For example, in its *World Investment Report 2001*, the United Nations Conference on Trade and Development (UNCTAD) lists a number of specific government measures that can create and deepen linkages between local and foreign firms without imposing restrictions. These include improving public access to information concerning potential projects or business opportunities, providing matchmaking services, fostering training programs, and providing various forms of financial support.³² Research conducted by the International Finance Corp. reaches similar conclusions, finding that government can play an important role in improving information flows and ensuring that regulatory and taxation policies do not impose a disproportionate burden on smaller enterprises.³³

³² UNCTAD, *World Investment Report 2001: Promoting Linkages*, table VI.1, p. 210.

³³ Kristin Hallberg, "A Market-Oriented Strategy for Small and Medium-Scale Enterprises," International Finance Corporation, Discussion Paper No. 40, May 2000, p. 8.

CHAPTER 5

POTENTIAL FOR LIBERALIZATION OF OIL AND GAS FIELD SERVICES UNDER THE GATS

Oil and gas field services include a vast array of activities that support the identification of hydrocarbon reserves and the subsequent extraction of resources. Because of the global nature of the oil and gas industry, field services are commonly provided, or traded, internationally. However, as noted in chapter 4, though they are not specific to the oil and gas field services industry, a number of factors limit the ability of field service providers to compete in foreign markets, and thereby constitute impediments to trade. Chief among these are problems with regulatory transparency and discriminatory treatment of foreign service providers.

The fact that policy measures could inhibit the free exchange of services internationally evokes the question of how existing international trade rules may relate to the oil and gas field services industry. International trade rules are embodied in various bilateral, regional, and multilateral agreements. A unifying element of trade agreements is that they generally seek the elimination of certain government policy measures that restrain trade. Within this ambit, however, trade agreements differ substantially in terms of scope (i.e., geographic and industry coverage) and in substance (i.e., the actual content of the negotiated rules, or disciplines). At this time, the General Agreement on Trade in Services (GATS) may be most relevant to oil and gas field services because it is global in scope and an active round of negotiations is presently underway. One of the World Trade Organization (WTO) agreements, the GATS has 144 signatories and GATS rules are potentially applicable to all service sectors. Present WTO members comprise 22 of the top 30 oil-producing countries, and account for approximately 43 percent of world oil reserves and 58 percent of world oil production. These 22 countries also account for 35 percent of world natural gas reserves and 57 percent of world natural gas production. Two other large oil- and gas-producing countries, Russia¹ and Saudi Arabia,² are currently in the process of acceding to the WTO. The GATS, which entered into effect in 1995, contains a built-in agenda that calls for periodic rounds of negotiations in pursuit of progressive liberalization. In accordance with this mandate, a new round of negotiations began on January 1, 2000, with a target date for conclusion of January 1, 2005. Thus the GATS offers an immediate avenue for raising issues concerning trade in oil and gas field services in a global forum.³

¹ Russia accounts for approximately 5 percent of total world oil reserves, and 31 percent of total world natural gas reserves.

² Saudi Arabia accounts for approximately 25 percent of total world oil reserves, and 4 percent of total world natural gas reserves.

³ For additional information on the GATS and the text of current negotiating proposals, see "The Services Negotiations," found on the WTO website at Internet address <http://www.wto.org/>.

In broad terms, the GATS consists of a framework of principles to which WTO members make binding commitments (table 5-1). Such commitments may be divided into two categories: general commitments that apply to virtually all possible service sectors,⁴ and specific commitments that apply only to those service sectors that are explicitly identified by each country in a “Schedule of Specific Commitments.” General commitments include the obligations concerning most-favored-nation treatment and transparency, whereas specific commitments include the obligations concerning market access and national treatment. Importantly, the general obligations concerning domestic regulation and monopolies and exclusive suppliers enter into effect only for service sectors that are explicitly described in the schedule of specific commitments. Consequently, the actual scope of each country’s obligations under the GATS is dependent upon the list of service sectors that it has elected to include within its schedule of specific commitments.

In large part, the principles contained in the GATS appear to address the impediments to trade identified by industry participants. For example, the concerns most frequently voiced by industry include lack of transparency, local labor requirements, joint-venture requirements, limitations on foreign investment, and technology transfer requirements. Some issues concerning transparency are addressed in article III, which requires prompt publication of relevant measures of general application; notification to the WTO of changes in laws, regulations, or administrative guidelines with significant bearing on services trade; establishment of enquiry points for use by other WTO members; and prompt responses to information requests from other WTO members. Issues concerning the regulatory process are addressed in article VI, which requires members to avoid using regulatory powers in such a way as to create services trade barriers; to ensure that measures of general application are administered in a reasonable, objective, and impartial manner; and, for sectors in which market access or national treatment commitments are undertaken, to ensure that licensing and qualification requirements or technical standards are based on objective and transparent criteria, are not more burdensome than necessary, and in the case of licensing procedures, are not in themselves a restriction on the supply of the service. Joint-venture requirements and limitations on foreign investment are addressed in the market access discipline (article XVI), which calls for negotiation over measures that require certain types of legal entity or joint venture, among other things. Discriminatory treatment of foreign firms is addressed by the national treatment discipline (article XVII), which requires that foreign service suppliers be treated no less favorably than domestic service suppliers, as well as in the most-favored nation discipline (article II), which requires that all foreign service suppliers be treated equally.⁵

Although the GATS addresses many of the issues that may impede trade, there are a few important caveats with particular bearing on energy services. For example, the

⁴ The sole exception is air-transport services.

⁵ An important distinction between national treatment and MFN treatment under the GATS is that the national treatment discipline is elective, in that WTO members choose to commit to this discipline on a sector-by-sector basis, whereas the MFN discipline applies to all members and all sectors. In addition, WTO members may modify commitments to national treatment, subject to certain conditions, but no such modifications are permitted with respect to the MFN obligation.

Table 5-1
Selected GATS provisions

Market access ¹	<p>The GATS market access principle, contained in article XVI, establishes the objective of progressively eliminating a set of six specific types of limitations to market access. These are:</p> <ol style="list-style-type: none"> 1) Limitations on the number of service suppliers whether in the form of numerical quotas, monopolies, exclusive service suppliers or the requirement of an economic needs test; 2) Limitations on the total value of service transactions or assets in the form of numerical quotas or the requirement of an economic needs test; 3) Limitations on the total number of service operations or on the total quantity of service output expressed in terms of designated numerical units in the form of quotas or the requirement of an economic needs test; 4) Limitations on the total number of natural persons that may be employed in a particular service sector or that a service supplier may employ and who are necessary for, and directly related to, the supply of a specific service in the form of numerical quotas or the requirement of an economic needs test; 5) Measures which restrict or require specific types of legal entity or joint venture through which a service supplier may supply a service; and 6) Limitations on the participation of foreign capital in terms of maximum percentage limit on foreign share-holding or the total value of individual or aggregate foreign investment.
National treatment ¹	<p>Article XVII provides for national treatment, which is described as treatment no less favorable than that accorded to domestic services and service suppliers.</p>
Most-favored-nation treatment	<p>Article II provides for most-favored-nation treatment (MFN), through which WTO members commit to accord to services and service suppliers of any other member treatment no less favorable than that accorded to like services and service suppliers of any other country. Members must adhere to MFN principles except in those areas in which they listed exemptions at the time they signed the GATS or acceded to the WTO. No new exemptions may be listed.</p>
Transparency	<p>GATS transparency obligations are contained in article III, which requires:</p> <ol style="list-style-type: none"> 1) Prompt publication of relevant measures of general application 2) Notification to the WTO of significant changes in laws, regulations, or administrative guidelines with significant bearing on services trade 3) Establishment of enquiry points for use by other WTO members 4) Prompt responses to information requests from other WTO members
Domestic regulation ¹	<p>GATS domestic regulation obligations, as contained in article VI, require WTO members to:</p> <ol style="list-style-type: none"> 1) Avoid using regulatory powers in such a way as to create services trade barriers 2) Ensure that measures of general application are administered in a reasonable, objective, and impartial manner 3) For sectors in which specific commitments are undertaken regarding market access or national treatment, ensure that licensing and qualification requirements or technical standards (1) are based on objective and transparent criteria, (2) are not more burdensome than necessary, and (3) in the case of licensing procedures, are not in themselves a restriction on the supply of the service.
Monopolies and exclusive suppliers ¹	<p>Article VIII of the GATS asserts that WTO members should ensure that, in cases where a monopoly supplier competes in supplying a service outside the scope of its monopoly rights, such a supplier does not abuse its monopoly position in a manner that limits market access or national treatment.</p>

¹ These provisions apply only to the service sectors positively listed in each country's schedule of specific commitments.

GATS does not presently address government procurement of services or government-provided services, two areas of importance given the strong role played by governments and state-owned enterprises in the energy sector. Another caveat is that the existing disciplines on transparency and domestic regulation may not be sufficiently effective, leading some WTO members to propose new disciplines for transparency in the regulatory process. For example, Canada observes that the present disciplines may not ensure that regulatory authorities provide adequate information concerning regulatory procedures; the process available to seek changes to the regulatory environment; and the options available for input to or redress from regulatory changes.⁶ The United States takes this a step further to suggest that new GATS principles should be developed to address transparency in domestic regulation. Important elements of these proposed disciplines include obligations to provide prior notification of regulatory changes and an opportunity for public comment; to make publicly available the criteria to obtain, renew, retain, or relinquish a license or authorization, as well as the criteria under which a regulator could suspend, revoke, or terminate a license or authorization; to ensure that fees charged in connection with a license or authorization are fair and reasonable, and not designed to limit the number of applications; to require that regulators provide an explanation justifying denial of a license and provide an opportunity to resubmit or amend applications; to provide applicants the right to file complaints regarding their treatment and the right of appeal in the event a license application is denied; and to provide notification of regulatory enforcement proceedings, along with the opportunity to retain counsel of choice and submit evidence.⁷

Perhaps the most significant shortcoming of the GATS from the perspective of the oil and gas field services industry is that, as noted previously, the actual scope of each country's obligations varies according to the list of service sectors contained in its schedule of specific commitments. Of the six GATS articles described in table 5-1, only articles II (MFN) and III (transparency) apply automatically to all service sectors. Articles VI (domestic regulation), VIII (monopolies and exclusive suppliers), XVI (market access), and XVII (national treatment) apply only to the sectors that each country elected to list in its schedule. This means member countries that have not listed oil and gas field services in their schedules are not bound to permit market access or accord national treatment to foreign service providers, nor are they bound by the general obligations on domestic regulation and monopolies and exclusive suppliers. Moreover, oil and gas field services are not explicitly identified in the list of service sectors used in scheduling commitments.⁸ As a result, prior to this round of negotiations, WTO members had no clear means of requesting specific commitments on oil and gas field services, and field service providers had little indication of the extent to which specific commitments under the GATS apply to

⁶ WTO, Council for Trade in Services, Special Session, "Communication from Canada: Initial Negotiating Proposal on Regulatory Transparency and Predictability," S/CSS/W/47, Mar. 14, 2001, found at Internet address <http://www.wto.org/>, retrieved Nov. 12, 2002.

⁷ WTO, Council for Trade in Services, Special Session, "Communication from the United States: Transparency in Domestic Regulation," S/CSS/W/102, July 13, 2001, found at Internet address <http://www.wto.org/>, retrieved Nov. 12, 2002.

⁸ This list is identified by its document identification number MTN.GNS/W/120 and includes cross references to industry definitions contained in the United Nations Provisional Central Product Classification (CPC).

their operations. These factors led some within the industry to conclude that the GATS had simply overlooked energy services.⁹

To address this perceived shortcoming and promote the negotiation of energy services under the GATS, several energy companies and trade associations joined together to establish the Energy Services Coalition in 1999.¹⁰ The first priority of this group, which presently includes more than 60 members, was to encourage GATS negotiators to create a commercially meaningful classification of energy services that would serve as a basis for negotiating market access and national treatment commitments.

The concerns of the Energy Services Coalition regarding the classification of energy services appear to be shared by many WTO members. As of January 2003, nine WTO members had presented negotiating proposals calling for improved coverage of oil and gas field services.¹¹ In addition, several members have established an informal group to consider the classification of oil and gas field services for the purpose of requesting specific commitments. Through discussions among these members, a consensus appears to have developed that oil and gas field services are in fact contained within the industry sector list used as a guide in scheduling commitments, and three distinct categories have emerged as being most relevant: “Services Incidental to Mining,” which includes services provided at oil and gas fields; “Related Scientific and Technical Consulting Services,” which includes various geological exploration services; and “Technical Testing and Analysis Services,” which includes core analysis and well logging services (table 5-2).¹² Other service categories that are important, but not quite so specific to energy, include “Construction Services,” which would include the construction of pipelines and production facilities; as well as “Engineering Services” and “Integrated Engineering Services,” which encompass various design and project management activities.

A review of existing commitments suggests that there is considerable room for broadening the coverage of oil and gas field services, both in terms of improving the substance of present commitments and in securing newly scheduled commitments. Of the 144 WTO members, 51 made some binding commitments that apply to at least one of the three categories that are most relevant to field services¹³ (see table 5-3 for a summary of these commitments and appendix C for the full text). These countries account for roughly 36 percent of world oil reserves, 42 percent of world oil production, 30 percent of world natural gas reserves, and 48 percent of world natural gas production. Twenty members made full commitments for services incidental to mining, 15 members made full commitments for scientific and technical

⁹ See, e.g., Rachel Thompson, “Integrating Energy Services into the World Trading System,” Washington, DC, Apr. 10, 2000, p. 1.

¹⁰ Ibid.

¹¹ These members include Canada, Chile, Cuba, Japan, the European Union, Norway, Taiwan, the United States, and Venezuela.

¹² U.S. Government representative, interview by USITC staff, Dec. 11, 2002.

¹³ For the purposes of tabulation, EU members were counted as one country. GATS schedules of specific commitments may be found on the WTO website at Internet address <http://www.wto.org/>.

Table 5-2
Examples of energy services contained in selected headings of the Services Sectoral Classification List, which is used in scheduling commitments under the General Agreement on Trade in Services

Services Sectoral Classification Heading	Examples of energy services
Services incidental to mining	<ul style="list-style-type: none"> • Onshore site preparation and rig installation • Drilling • Drilling bits services • Casing and tubular services • Mud engineering and supply • Solids control • Fishing and downhole special operations • Wellsite geology and drilling control • Core taking • Well testing • Other wireline services • Supply and operation of completion fluids (brines) • Supply and installation of completion devices • Cementing (pressure pumping) • Stimulation services (fracturing, acidizing, and pressure pumping) • Workover and well repair services • Plugging and abandoning of wells
Related scientific and technical consulting	<ul style="list-style-type: none"> • Mapping services • Geophysical and geological services • Hydrological and meteorological services • Reservoir engineering and secondary recovery services
Technical testing and analysis services	<ul style="list-style-type: none"> • Core analysis and other laboratory analysis services • Electrical, acoustical, and radioactive logging services
Construction services	<ul style="list-style-type: none"> • Construction and installation of production equipment • Construction of facilities • Replacement, upgrade, and refurbishment of facilities
Engineering and integrated engineering services	<ul style="list-style-type: none"> • Design of production equipment • Design of facilities • Integrated engineering services for construction of facilities
Environmental services	<ul style="list-style-type: none"> • Oil spill control services • Remediation of contaminated areas and facilities • Handling, treatment, and disposal of wastes • Pollution control and monitoring services

Source: Compiled by the U.S. International Trade Commission.

Table 5-3
Summary of Uruguay Round market access and national treatment commitments for sectors most relevant to oil and gas field services

Country	Services incidental to mining	Scientific and technical consulting services	Technical testing and analysis services
Albania	Full	Full	Full
Argentina	Full	—	—
Australia	<i>Limited:</i> Full commitments apply to consultancy only.	<i>Limited:</i> Full commitments exclude geological, geophysical, and other prospecting services.	—
Bulgaria	<i>Limited:</i> Bound only consumption abroad for repair and dismantling services.	<i>Limited:</i> Bound only consumption abroad.	<i>Limited:</i> Bound only consumption abroad.
Canada	Full	<i>Limited:</i> Some limitations on surveying and some differential tax treatment.	Full
China	<i>Limited:</i> Joint venture requirement, form of establishment limitation, reporting requirement, foreign currency obligation.	<i>Limited:</i> Joint venture requirement.	<i>Limited:</i> Joint venture requirement (to be phased out over 4 years).
Côte D'Ivoire	—	—	<i>Limited:</i> Full commitment for commercial presence only.
Czech Republic	—	Full	—
Dominican Republic	<i>Limited:</i> National treatment unbound.	<i>Limited:</i> National treatment unbound.	<i>Limited:</i> National treatment unbound.
Ecuador	Full	<i>Limited:</i> Cross-border supply unbound.	—
Estonia	—	—	Limited
EU - all members	<i>Limited:</i> Full commitments apply only to advisory and consulting services.	<i>Limited:</i> Cross-border supply of exploration services and the operation on mines are excluded.	Full
<i>Denmark</i>	(¹)	(¹)	Full
<i>Finland</i>	(¹)	Full	Full
<i>France</i>	(¹)	<i>Limited:</i> Authorization required for commercial presence, unbound for cross-border supply, surveying limited.	(¹)
<i>Germany</i>	(¹)	<i>Limited:</i> Some limitations on surveying.	(¹)

See footnote at end of table.

Table 5-3—Continued

Summary of Uruguay Round market access and national treatment commitments for sectors most relevant to oil and gas field services

Country	Services incidental to mining	Scientific and technical consulting services	Technical testing and analysis services
<i>Italy</i>	(¹)	<i>Limited:</i> Exclusive rights may limit market access, some possible limitations on surveyors and geologists.	Limited: For chemists and biologists cross-border supply is excluded and commercial presence may be limited.
<i>Portugal</i>	<i>Limited:</i> Establishment of a commercial presence may not be permitted.	<i>Limited:</i> Establishment of a commercial presence may not be permitted.	(¹)
<i>Spain</i>	—	<i>Limited:</i> Establishment of a commercial presence may not be permitted for surveyors and geologists.	<i>Limited:</i> Establishment of a commercial presence may not be permitted for biologists and chemical analysts.
<i>Sweden</i>	(¹)	Full	(¹)
<i>United Kingdom</i>	(¹)	(¹)	(¹)
Georgia	Full	Full	Full
Hungary	Full	Full	Full
Iceland	—	—	Full
India	—	—	<i>Limited:</i> Foreign equity limited to 51 percent, unbound for cross-border supply.
Indonesia	—	—	<i>Limited:</i> Joint venture requirement, unbound for cross-border supply.
Israel	Full	Full	—
Japan	—	<i>Limited:</i> Full commitment applies only to civil engineering consulting services and excludes oil and gas field services. Surveying service requires a commercial presence.	<i>Limited:</i> Full commitment applies only to civil engineering consulting services and only a small non-energy portion of the category (86761).
Jordan	—	<i>Limited:</i> Appears to exclude oil and gas field services, also limits foreign equity to 50 percent.	<i>Limited:</i> Limits foreign equity to 50 percent.
Korea	<i>Limited:</i> Limited to consulting only, and cross-border supply unbound.	Full	<i>Limited:</i> Excludes services related to oil and gas other than technical inspection services.

See footnote at end of table.

Table 5-3—Continued

Summary of Uruguay Round market access and national treatment commitments for sectors most relevant to oil and gas field services

Country	Services incidental to mining	Scientific and technical consulting services	Technical testing and analysis services
Kuwait	—	—	<i>Limited:</i> Cross-border supply unbound.
Kyrgyz Republic	Full	Full	Full
Latvia	Full	Full	Full
Lesotho	<i>Limited:</i> Unbound for all modes of supply, except for mode 4 commitments scheduled in the horizontal section.	<i>Limited:</i> Unbound for all modes of supply, except for mode 4 commitments scheduled in the horizontal section.	Full
Liechtenstein	<i>Limited:</i> Excludes prospecting, surveying, exploration and exploitation.	<i>Limited:</i> Excludes prospecting, surveying, exploration and exploitation.	Full
Lithuania	—	Full	Full
Malawi	Full	—	Full
Malaysia	—	—	<i>Limited:</i> Joint venture required.
Moldova	Full	Full	Full
Mongolia	Full	Full	Full
Namibia	—	<i>Limited:</i> Full commitment on 86751 applies only to offshore exploration.	—
Nicaragua	Full	—	—
Norway	—	<i>Limited:</i> Full commitment excludes offshore activities.	Full
Oman	—	<i>Limited:</i> Foreign equity limited to 51 percent.	<i>Limited:</i> Foreign equity limited to 51 percent.
Pakistan	Full	—	<i>Limited:</i> Unbound for cross-border supply.
Panama	Full	<i>Limited:</i> Unbound for cross-border supply, engineering license may be required.	—
Poland	Full	—	—
Qatar	—	—	Full
Singapore	<i>Limited:</i> Full commitments apply only to consulting services.	—	—
Slovak Republic	—	Full	—

See footnote at end of table.

Table 5-3—Continued

Summary of Uruguay Round market access and national treatment commitments for sectors most relevant to oil and gas field services

Country	Services incidental to mining	Scientific and technical consulting services	Technical testing and analysis services
Slovenia	—	—	<i>Limited:</i> Concession rights required for activities considered to be public utilities.
South Africa	Full	Full	Full
Swaziland	—	—	<i>Limited:</i> Unbound for cross-border supply.
Switzerland	<i>Limited:</i> Full commitment excludes prospecting, surveying, and exploration.	<i>Limited:</i> Full commitment excludes prospecting, surveying, and exploration.	Full
Thailand	<i>Limited:</i> Foreign equity limited to 49 percent.	—	<i>Limited:</i> Foreign equity limited to 49 percent, unbound for cross-border supply.
Turkey	<i>Limited:</i> Full commitment limited only by a nondiscriminatory licensing requirement.	—	—
United Arab Emirates	—	—	Full
United States	Full	<i>Limited:</i> Full commitment excludes some surveying activities.	—
Venezuela	Full	<i>Limited:</i> Unbound for cross-border supply.	—
Zambia	Full	—	Full

¹ No additional commitments or limitations other than those that apply to all EU members.

Note: “Full” signifies that the WTO member has made a commitment to accord full market access and national treatment to foreign service providers for the most relevant modes of supply. For services incidental to mining, cross-border supply is not considered to be relevant. “—” signifies that no meaningful commitments were scheduled.

Source: Compiled by the U.S. International Trade Commission.

consulting services, and 22 members made full commitments for technical testing and analysis services. Only eight members made binding commitments to accord full market access and national treatment for the entire package of services (Albania, Georgia, Hungary, Kyrgyz Republic, Latvia, Moldova, Mongolia, and South Africa). The majority of commitments for oil and gas field services could be considered “partial” commitments, in that members limited the scope of their obligation by listing some kind of reservation. The significance of partial commitments varies widely. For example, a number of members indicated that market access in the provision of surveying services is limited to certain designated individuals or entities, or that certain technical testing and analysis services are reserved for specific organizations, such as those charged with monitoring public health and safety standards. Neither of these limitations appears to have significant bearing on the operations of oil and gas field service providers. However, seven members listed reservations specific to oil and gas field services that preserve policies that either require joint ventures or otherwise limit foreign equity investment (China, India, Indonesia, Jordan, Malaysia, Oman, and Thailand). As noted in chapter 4, mandatory joint-venture requirements are perceived by industry sources as a significant restriction because such a business structure may not be the most commercially desirable, and joint-venture requirements can be seen as a coercive means of transferring technology.

On the basis of these existing commitments, there appears to be considerable room for pursuing further liberalization of oil and gas field services under the GATS. The 93 WTO members¹⁴ who have yet to list any specific commitments on the three sectors most relevant to oil and gas field services could likely schedule some market access and national treatment commitments. Even partial commitments offer the potential benefits of increased transparency, improved legal certainty, the establishment of a baseline level of treatment such that a country cannot become more restrictive, and broader coverage of the general disciplines on domestic regulation and monopolies that are activated by scheduling specific commitments. Meanwhile, the 43 countries that have scheduled partial commitments could liberalize further by extending their commitments to all three of these energy-specific sectors and reducing or eliminating any significant restrictions on market access and national treatment. Improvements in the bindings of these 43 countries, given their large collective share of global oil and gas reserves and production, could yield the largest gains from liberalization.

¹⁴ The remaining 93 WTO members that have yet to make binding commitments in oil and gas field services account for 7 percent of world oil reserves, 16 percent of world oil production, 5 percent of world natural gas reserves, and 7 percent of world natural gas production.

CHAPTER 6

CONCLUSION

Oil and gas field services comprise a host of activities related to the development of hydrocarbon resources. These activities range from contract drilling, development, and completion of wells onshore and offshore, to a variety of support activities like seismic imaging, measurement-while-drilling, artificial lift, and well stimulation services. Providers of oil and gas field services include large, integrated companies that offer a comprehensive array of services as well as smaller niche players who provide specialized services and expertise. The primary consumers of oil and gas field services are the exploration and production companies that hold or have acquired the production rights for a designated region. These include the major integrated oil companies, national oil companies, and smaller independent oil companies.

Because most countries have at least some hydrocarbon resources, and all countries have a financial interest in developing these resources, oil and gas field services are among the most global of service activities. However, in some foreign markets, service providers encounter impediments that reportedly have an adverse effect on the nature and scope of their operations. The most significant of these impediments include poor transparency, specific labor requirements, joint venture requirements, limitations on foreign investment, and technology transfer requirements.

Trade disciplines contained within the General Agreement on Trade in Services (GATS) address many of the impediments identified by industry representatives. In addition, with 144 signatories and an active round of negotiations presently underway, the GATS may afford an immediate avenue for raising issues concerning trade in oil and gas field services in a global forum. A review of existing commitments under the GATS reveals that there is considerable room for progress toward broader coverage of oil and gas field services, both in terms of the number of countries making specific commitments and in the actual substance of these commitments. To date, only 51 WTO members have made binding commitments that apply specifically to oil and gas field services, and the scope of many of these commitments is limited by various reservations.

Despite an overall market size estimated to be on the order of \$100 billion, international trade in oil and gas field services is not captured effectively by official trade statistics. Because the effects of impediments to trade generally are unmeasurable as well, a quantitative assessment of the costs of trade impediments or the benefits of liberalization is not possible. Nevertheless, improvements in transparency and the elimination of discriminatory practices likely will yield the traditional benefits of trade liberalization. These include the gains that accrue to countries that specialize in the goods and services for which they have a comparative advantage; downstream benefits that accrue to both petroleum producers and consumers as a result of decreased extraction costs; and the benefits derived from knowledge spillovers that ultimately reduce overall industry costs.

In practical terms, further liberalization will improve the general business environment for oil and gas field service providers. This, in turn, is likely to enhance the level of competition, leading to lower costs associated with the exploration and extraction of oil and natural gas to the ultimate benefit of oil and gas producers, consumers, and the global economy.

APPENDIX A

REQUEST LETTER

JUN 18 REC-ER

2247 Office of the Secretary, Int'l Trade Commission

EXECUTIVE OFFICE OF THE PRESIDENT
 THE UNITED STATES TRADE REPRESENTATIVE
 WASHINGTON, D.C. 20508

JUN 17 2002

The Honorable Stephen Koplan
 Chairman
 U.S. International Trade Commission
 500 E Street, SW
 Washington, DC 20436

000018

Dear Chairman Koplan:

As you know, members of the World Trade Organization (WTO) have been engaged in negotiations under the General Agreement on Trade in Services (GATS) since January 2000. These negotiations are intended to liberalize services trade by reducing or eliminating measures that limit effective market access.

With these negotiations in mind, this office requested that the U.S. International Trade Commission initiate a series of reports on international trade in energy services. Energy services clearly are of great importance to the global economy. However, prior to these negotiations, energy services had not been identified as a discrete service activity and the nature of trade in energy services, as well as the extent of impediments to such trade, had not been carefully considered.

The Commission's two previous studies on energy services have contributed substantially to the negotiations by increasing our level of understanding of services trade in the electric power and natural gas industries. A third study that focuses on upstream oil and gas field services would complement this earlier work by addressing the critical first link in the chain of energy services: exploration and development services. Trade liberalization that enhances efficiency in the exploration and development of oil and gas resources offers potentially significant global economic benefits by reducing production costs and increasing access to energy.

Therefore, I request, pursuant to authority delegated by the President under section 332(g) of the Tariff Act of 1930, that the U.S. International Trade Commission conduct an investigation and prepare a report that (1) describes the various activities involved in the provision of oil and gas field services, (2) describes the nature of trade in oil and gas field services, and (3) concisely examines the extent of impediments to trade and the potential benefits of trade liberalization. Since oil and gas field services are conducted in a vast number of countries, the Commission should focus on issues that could be relevant multilaterally.

The Honorable Stephen Koplan
Page Two

The Commission is requested to deliver this report no later than nine months from receipt of this letter. This office intends to make the Commission's report available to the general public in its entirety. Therefore, the report should not contain any confidential business or national security classified information.

The Commission's assistance in this matter is greatly appreciated.

Thanks for your help
on this.

Sincerely,



Robert B. Zoellick

APPENDIX B
***FEDERAL REGISTER* NOTICES**

regulations. Except for comments provided in electronic format, commenters should submit two copies of their written comments, where practicable. The BLM will not necessarily consider comments received after the time indicated under the DATES section or at locations other than that listed in the ADDRESSES section.

In the event there is a request under the Freedom of Information Act (FOIA) for a copy of your comments, we intend to make them available in their entirety, including your name and address (or your e-mail address if you file electronically). However, if you do not want us to release your name and address (or e-mail address) in response to a FOIA request, you must state this prominently at the beginning of your comment. We will honor your wish to the extent allowed by the law. All submissions from organizations or businesses and from individuals identifying themselves as representatives or officials of organizations or business will be in their entirety, including names and addresses (or e-mail addresses).

Electronic Access and Filing Address: Commenters may transmit comments electronically via the Internet to: lee_barkow@blm.gov. Please include the identifier "Science4" in the subject of your message and your name and address in the body of your message.

III. Accessibility

The meeting sites are accessible to individuals with disabilities. An individual with a disability who will need an auxiliary aid or service to participate in the hearing, such as interpreting service, assistive listening device, or materials in an alternate format, must notify the person listed under **FOR FURTHER INFORMATION CONTACT** two weeks before the scheduled hearing date. Although BLM will attempt to meet a request received after that date, the requested auxiliary aid or service may not be available because of insufficient time to arrange it.

Lee Barkow,

Director, National Science and Technology Center.

[FR Doc. 02-17684 Filed 7-12-02; 8:45 am]

BILLING CODE 4310-84-P

DEPARTMENT OF THE INTERIOR

National Park Service

National Capital Memorial Commission; Notice of Public Meeting

AGENCY: Department of the Interior, National Park Service, National Capital Memorial Commission.

ACTION: Notice of meeting.

SUMMARY: Notice is hereby given in accordance with the Federal Advisory Committee Act that a meeting of the National Capital Memorial Commission (the Commission) will be held at 10 a.m., on Wednesday, July 31, 2002, at the National Building Museum, Room 312, 5th and F Streets, NW., Washington, DC.

The purpose of the meeting will be to discuss currently authorized and proposed memorials in the District of Columbia and environs.

In addition to discussing general matters and conducting routine business, the Commission will review the following:

Action Items

(1) Consideration of a recommendation relative to placement, within Area I as established by the Commemorative Works Act of 1986, of the Memorial to President John Adams and his Legacy (Pub. L. 107-62, November 5, 2001).

(2) Continuation of consideration of the alternative site study for the plaque to be placed at the Lincoln Memorial commemorating the "I Have a Dream" speech of Martin Luther King, Jr.

(3) Legislative Proposals introduced in the 107th Congress to establish memorials in the District of Columbia and its environs.

Other Business

General matters and routine business.

The meeting will be open to the public. Any person may file with the Commission a written statement concerning the matters to be discussed. Persons who wish to file a written statement or testify at the meeting or who want further information concerning the meeting may contact Ms. Nancy Young, Secretary to the Commission, at (202) 619-7097.

DATES: July 31, 2002.

ADDRESSES: Room 312, National Building Museum, 5th and F Streets, NW., Washington, D.C., 20001.

FOR FURTHER INFORMATION CONTACT: Ms. Nancy Young, Secretary to the Commission, 202-619-7097.

SUPPLEMENTARY INFORMATION: The Commission was established by Public

Law 99-652, the Commemorative Works Act (40 U.S.C. 1001 *et. seq.*), to advise the Secretary and the Administrator, General Services Administration, (the Administrator) on policy and procedures for establishment of (and proposals to establish) commemorative works in the District of Columbia and its environs, as well as such other matters as it may deem appropriate concerning commemorative works.

The Commission examines each memorial proposal for conformance to the Commemorative Works Act, and makes recommendations to the Secretary and the Administrator and to Members and Committees of Congress. The Commission also serves as a source of information for persons seeking to establish memorials in Washington, DC., and its environs.

The members of the Commission are as follows:

Director, National Park Service
Chairman, National Capital Planning Commission
Architect of the Capitol
Chairman, American Battle Monuments Commission
Chairman, Commission of Fine Arts
Mayor of the District of Columbia
Administrator, General Services Administration
Secretary of Defense

Dated: June 26, 2002.

Terry R. Carlstrom,

Regional Director, National Capital Region.

[FR Doc. 02-17604 Filed 7-12-02; 8:45 am]

BILLING CODE 4310-70-M

INTERNATIONAL TRADE COMMISSION

[Investigation 332-444]

Oil and Gas Field Services: Impediments to Trade and Prospects for Liberalization

AGENCY: International Trade Commission.

ACTION: Institution of investigation and scheduling of public hearing.

EFFECTIVE DATE: July 8, 2002.

SUMMARY: Following receipt of a request on June 18, 2002, from the United States Trade Representative (USTR), the Commission instituted investigation No. 332-444, Oil and Gas Field Services: Impediments to Trade and Prospects for Liberalization, under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)).

FOR FURTHER INFORMATION CONTACT: Information specific to this investigation may be obtained from Joann Tortorice,

Project Leader (202-205-3032; jtortorice@usitc.gov), Amanda Horan, **Deputy Project Leader (202-205-3459;** ahoran@usitc.gov), or Richard Brown, **Chief, Services and Investment Division (202-205-3438;** rbrown@usitc.gov), **Office of Industries, U.S. International Trade Commission, Washington, DC, 20436.** For information on the legal aspects of this investigation, contact William Gearhart of the Office of the General Counsel (202-205-3091; wgearhart@usitc.gov). Hearing impaired individuals are advised that information on this matter can be obtained by contacting the TDD terminal on (202) 205-1810.

Background: As requested by the USTR, in its report the Commission will (1) describe the various activities involved in the provision of oil and gas field services; (2) describe the nature of trade in oil and gas field services; and (3) examine the extent of impediments to trade and potential benefits of trade liberalization. Since oil and gas field services are conducted in a large number of countries, USTR has requested that the Commission's study focus on issues that could be relevant multilaterally.

For the purpose of this study, oil and gas field services are broadly defined to include evaluation and exploration activities; drilling activities; and well development and completion activities. The letter follows similar requests made by the USTR in November 1999 and February 2001 for the Commission to conduct investigations on electric power services and natural gas services in selected foreign markets. The Commission submitted its report on electric power services to the USTR on November 23, 2000, and on natural gas services on October 16, 2001. Copies of these reports may be obtained by contacting the Office of the Secretary at 202-205-2000 or by accessing the USITC Internet server ww.usitc.gov. The USTR asked that the Commission furnish its report by March 18, 2003, and that the Commission make the report available to the public in its entirety.

Public Hearing: A public hearing in connection with the investigation will be held at the U.S. International Trade Commission Building, 500 E Street SW., Washington, DC, beginning at 9:30 a.m. on October 1, 2002. All persons shall have the right to appear, by counsel or in person, to present information and to be heard. Requests to appear at the public hearing should be filed with the Secretary, United States International Trade Commission, 500 E Street SW., Washington, DC 20436, no later than 5:15 p.m., September 17, 2002. Any

prehearing briefs (original and 14 copies) should be filed not later than 5:15 p.m., September 19, 2002; the deadline for filing post-hearing briefs or statements is 5:15 p.m., October 22, 2002. In the event that, as of the close of business on September 17, 2002, no witnesses are scheduled to appear at the hearing, the hearing will be canceled. Any person interested in attending the hearing as an observer or non-participant may call the Secretary of the Commission (202-205-1806) after September 17, 2002, for information concerning whether the hearing will be held.

Written Submissions: In lieu of or in addition to participating in the hearing, interested parties are invited to submit written statements (original and 14 copies) concerning the matters to be addressed by the Commission in its report on this investigation. Commercial or financial information that a submitter desires the Commission to treat as confidential must be submitted on separate sheets of paper, each clearly marked "Confidential Business Information" at the top. All submissions requesting confidential treatment must conform with the requirements of section § 201.6 of the Commission's Rules of Practice and Procedure (19 CFR 201.6). All written submissions, except for confidential business information, will be made available in the Office of the Secretary to the Commission for inspection by interested parties. The Commission will not include any confidential business information in the report it sends to the USTR. To be assured of consideration by the Commission, written statements relating to the Commission's report should be submitted to the Commission at the earliest practical date and should be received no later than the close of business on October 22, 2002. All submissions should be addressed to the Secretary, United States International Trade Commission, 500 E Street SW., Washington, DC 20436. The Commission's rules do not authorize filing submissions with the Secretary by facsimile or electronic means. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202-205-2000. General information concerning the Commission may also be obtained by accessing its Internet server (<http://www.usitc.gov>).

List of Subjects

WTO, GATS, Oil and gas field services.

Issued: July 9, 2002.

By order of the Commission.
Marilyn R. Abbott,
Secretary to the Commission.
[FR Doc. 02-17644 Filed 7-12-02; 8:45 am]
BILLING CODE 7020-02-P

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards

Subcommittee Meeting on Thermal-Hydraulic Phenomena; Notice of Meeting

The ACRS Subcommittee meeting on Thermal-Hydraulic Phenomena scheduled for July 17-18, 2002 has been changed to a one day meeting, which will be held on Wednesday, July 17, 2002 at 8:30 a.m. in Room T-2B3, 11545 Rockville Pike, Rockville, Maryland.

The Subcommittee will continue its review of the NRC Office of Nuclear Regulatory Research (RES) draft Regulatory Guide, DG-1120, "Transient and Accident Analysis Methods". The Subcommittee will also discuss the status of the RES experimental program pertaining to subcooled flow boiling phenomena.

Notice of this meeting was published in the Federal Register on Tuesday, July 2, 2002 (67 FR 44478). All other items pertaining to this meeting remain the same as previously published.

For further information contact: Mr. Paul A. Boehnert, Senior Staff Engineer (telephone 301-415-8065 or e-mail: PAB2@nrc.gov) between 7:30 a.m. and 5 p.m. (EDT).

Dated: July 9, 2002.

Sher Bahadur,

Associate Director for Technical Support.

[FR Doc. 02-17645 Filed 7-12-02; 8:45 am]

BILLING CODE 7590-01-P

NUCLEAR REGULATORY COMMISSION

Regulatory Guides; Withdrawal

The Nuclear Regulatory Commission is withdrawing Draft Regulatory Guide DG-4006, "Demonstrating Compliance with the Radiological Criteria for License Termination," from consideration as a regulatory guide. DG-4006 was published for public comment in August 1998.

This draft guide was issued to propose guidance on demonstrating compliance with radiological criteria at the sites of licensees who wish to terminate their licenses and release their sites. Appendix D of NUREG-1727,

facilities provide water for urban, industrial, and agricultural uses from the San Francisco Bay area to southern California. In the south Delta, much of the land is used for agriculture purposes. There are approximately 170 diversions within the area of the South Delta Water Agency (SDWA) that provide water for irrigation. Through its Programmatic EIS/EIR, CALFED determined that its overall program objectives could not be met without some south Delta conveyance improvements. The SDIP contains key conveyance improvements identified for implementation in Stage 1 of CALFED.

There are three primary issues with respect to water in the south Delta: Water level, water quality, and fishery concerns. For water level, current diversion rates and the proposed diversion rates could lower the water stage, making the water in the channels too low for agricultural purposes during some low-tide conditions. To mitigate the effects of the lowered stage levels, DWR has been installing temporary rock hydraulic barriers each year; however, temporary barriers are expensive and inflexible in use, and limit water quality actions in the south Delta. The second issue is related to water quality. In addition to an adequate water supply, salinity standards set forth by the State Water Resources Control Board must also be met. Water quality for agriculture has been addressed through a partial exchange of water during high tides. However, this method is limited to the exchange that the tides can offer. The third issue is fishery concerns related to salmon and Delta smelt. San Joaquin River salmon populations have greatly declined since the construction of the CVP and SWP. Some of the decline is attributable to the operation of the CVP and SWP Delta export facilities, where San Joaquin River salmon smolts are lost through predation and entrainment. DWR has been installing a temporary rock barrier at the Head of Old River (where Old River bifurcates from the San Joaquin River) to reduce the number of fish entering the south Delta channels and being lost due to predation or entrainment.

The major components of the SDIP are:

- Increasing the maximum allowable diversion capacity at the SWP's Clifton Court Forebay to 8,500 cubic feet per second;
- Dredging a portion of Old River to improve conveyance capability during periods of high SWP and CVP Delta exports;
- Construction of permanent operable barriers to improve water supply

reliability and water quality in the south Delta;

- Dredging local channels to reduce the frequency of barriers operations and to accommodate improvements to existing agricultural diversions both upstream and downstream of the proposed barriers;
- Constructing a permanent operable fish control structure at the head of Old River to reduce fish losses.

The SDIP is intended to address the needs of the export projects, the Delta ecosystem and local in-Delta agricultural water users. An integral element of the SDIP is to minimize water supply conflicts by incrementally increasing to the maximum pumping capability at Banks Pumping Plant when impacts to aquatic resources are low, thereby allowing reduced exports during environmentally sensitive times. The SDIP would provide more reliable long-term export capability by the SWP and CVP, protect local diversions in the Delta and minimize fishery impacts, and supplement and/or replace ongoing annual installation of temporary barriers and local dredging and diversion improvements in the Delta.

Alternatives

Initial types of alternatives identified for consideration involve alternative barrier design, number of barriers and locations of barriers, and operating criteria at Banks Pumping Plant. These alternatives will be analyzed in the EIS/EIR if they are determined to be reasonable and feasible alternatives that meet the basic purpose and need and objectives of the Proposed Action/Project. Additional alternatives may be identified through the public involvement and scoping process.

Additional Information

Comments provided on this NOI and as part of public scoping meetings, including names and home addresses of respondents, may be made available for public review. Individual respondents may request that their home address be withheld from public disclosure, which will be honored to the extent allowable by law. There may also be circumstances in which the respondent's identity may be withheld from public disclosure, as allowable by law. If you wish to withhold your name and/or address, you must state this prominently at the beginning of your comments. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public disclosure in their entirety.

If special services are required at the meeting, please contact Sammie Cervantes at (916) 978-5104, as far in advance of the meeting as possible. If a request cannot be honored, the requestor will be notified.

Dated: August 19, 2002.

Frank Michny,

Regional Environmental Officer.

[FR Doc. 02-22172 Filed 8-29-02; 8:45 am]

BILLING CODE 4310-MN-P

INTERNATIONAL TRADE COMMISSION

[Investigation 332-444]

Oil and Gas Field Services: Impediments to Trade and Prospects for Liberalization

AGENCY: International Trade Commission.

ACTION: Rescheduling of public hearing.

EFFECTIVE DATE: August 23, 2002.

SUMMARY: The public hearing on this matter, scheduled for October 1, 2002, has been rescheduled to October 3, 2002. The public hearing will be held at the U.S. International Trade Commission Building, 500 E Street SW., Washington, DC, beginning at 9:30 a.m. on October 3, 2002. All persons will have the right to appear, by counsel or in person, to present information and to be heard. Requests to appear at the public hearing should be filed with the Secretary, United States International Trade Commission, 500 E Street SW., Washington, DC 20436, no later than 5:15 p.m., September 17, 2002. Any prehearing briefs (original and 14 copies) should be filed not later than 5:15 p.m., September 19, 2002; the deadline for filing post-hearing briefs or statements is 5:15 p.m., October 22, 2002. Notice of institution of the investigation and an earlier scheduled hearing date were published in the *Federal Register* of July 15, 2002 (67 FR 46541). In the event that, at the close of business on September 17, 2002, no witnesses are scheduled to appear at the hearing, the hearing will be cancelled. Any person interested in attending the hearing as an observer or non-participant may call the Secretary of the Commission (202-205-2000) after September 17, 2002 for information concerning whether the hearing will be held.

FOR FURTHER INFORMATION CONTACT:

Information specific to this investigation may be obtained from Joann Tortorice, Project Leader (202-205-3032; jtortorice@usitc.gov), Amanda Horan,

Deputy Project Leader (202-205-3459; ahoran@usitc.gov), or Richard Brown, Chief, Services and Investment Division (202-205-3438; rbrown@usitc.gov), Office of Industries, U.S. International Trade Commission, Washington, DC, 20436. For information on the legal aspects of this investigation, contact William Gearhart of the Office of the General Counsel (202-205-3091; wgearhart@usitc.gov). Hearing impaired individuals are advised that information on this matter can be obtained by contacting the TDD terminal on (202) 205-1810.

Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202-205-2000. General information concerning the Commission may also be obtained by accessing its Internet server (<http://www.usitc.gov>).

List of Subjects: WTO, GATS, oil and gas field services.

Issued: August 26, 2002.

By order of the Commission.
Marilyn R. Abbott,
Secretary to the Commission.

[FR Doc. 02-22114 Filed 8-29-02; 8:58 am]

BILLING CODE 7020-02-P

INTERNATIONAL TRADE COMMISSION

[Investigation No. 731-TA-1013 (Preliminary)]

Saccharin from China

Determination

On the basis of the record¹ developed in the subject investigation, the United States International Trade Commission determines, pursuant to section 733(a) of the Tariff Act of 1930 (19 U.S.C. 1673b(a)) (the Act), that there is a reasonable indication that an industry in the United States is materially injured by reason of imports from China of saccharin, provided for in subheading 2925.11.00 of the Harmonized Tariff Schedule of the United States, that are alleged to be sold in the United States at less than fair value (LTFV).

Pursuant to § 207.18 of the Commission's rules, the Commission also gives notice of the commencement of the final phase of its investigation. The Commission will issue a final phase notice of scheduling, which will be published in the Federal Register as provided in § 207.21 of the

¹ The record is defined in sec. 207.2(f) of the Commission's rules of practice and procedure (19 CFR 207.2(f)).

² Commissioner Lynn M. Bragg not participating.

Commission's rules, upon notice from the Department of Commerce of an affirmative preliminary determination in the investigation under section 733(b) of the Act, or, if the preliminary determination is negative, upon notice of an affirmative final determination in that investigation under section 735(a) of the Act. Parties that filed entries of appearance in the preliminary phase of the investigation need not enter a separate appearance for the final phase of the investigation. Industrial users, and, if the merchandise under investigation is sold at the retail level, representative consumer organizations have the right to appear as parties in Commission antidumping and countervailing duty investigations. The Secretary will prepare a public service list containing the names and addresses of all persons, or their representatives, who are parties to the investigation.

Background

On July 11, 2002, a petition was filed with the Commission and Commerce by PMC Specialties Group, Inc., Cincinnati, OH, alleging that an industry in the United States is materially injured or threatened with material injury by reason of LTFV imports of saccharin from China. Accordingly, effective July 11, 2002, the Commission instituted antidumping duty investigation No. 731-TA-1013 (Preliminary).

Notice of the institution of the Commission's investigation and of a public conference to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the Federal Register of July 13, 2002 (67 FR 47398). The conference was held in Washington, DC, on August 1, 2002, and all persons who requested the opportunity were permitted to appear in person or by counsel.

The Commission transmitted its determination in this investigation to the Secretary of Commerce on August 26, 2002. The views of the Commission are contained in USITC Publication 3535 (September 2002), entitled Saccharin From China: Investigation No. 1013 (Preliminary).

By order of the Commission.

Issued: August 26, 2002.

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. 02-22185 Filed 8-29-02; 8:45 am]

BILLING CODE 7020-02-P

INTERNATIONAL TRADE COMMISSION

Possible Modifications to the International Harmonized System Nomenclature

AGENCY: International Trade Commission.

ACTION: Request for public comments on proposal to delete certain low-trade categories from the Harmonized System.

SUMMARY: The Commission is soliciting the views of interested parties on a proposal before the Review Subcommittee (RSC) of the World Customs Organization (WCO), Brussels, Belgium, to delete certain low-trade headings and subheadings from the international Harmonized Commodity Description and Coding System (Harmonized System or HS).

EFFECTIVE DATE: August 21, 2002.

FOR FURTHER INFORMATION CONTACT: Ronald H. Heller, Office of Tariff Affairs and Trade Agreements (O/TATA) (202/205-2596, E-Mail rheller@usitc.gov). The O/TATA fax number is 202/205-2616.

Background

The Harmonized System was established by an international Convention, which, inter alia, provides that the System should be kept up-to-date in light of changes in technology and patterns of international trade. The international HS nomenclature, which is maintained by the WCO, provides a uniform structural basis for the customs tariff and statistical nomenclatures of all major trading countries of the world, including the United States. The Commission, the U.S. Customs Service and the Bureau of the Census are responsible for the development of U.S. technical proposals concerning the HS under section 1210 of the Omnibus Trade and Competitiveness Act of 1988 (the 1988 Act) (19 U.S.C. 3010). A 1988 notice issued by the United States Trade Representative (53 FR 45646, November 10, 1988), established the Commission as the lead U.S. agency in considering proposals for HS amendments that are intended to ensure that it reflects such changes in technology and trade. The WCO expects to implement the next series of amendments to the HS nomenclature by the year 2007. As part of each review cycle, the RSC considers simplifying the HS by removing lines for which trade falls below a threshold value. HS lines that are eliminated are merged with HS lines containing like products. Noting that the HS has expanded over the years and now comprises 1,244 four-digit headings and

APPENDIX C
GATS COMMITMENTS ON OIL AND
GAS FIELD SERVICES BY COUNTRY

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Albania	CPC 883	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Argentina	CPC 833 (<i>Note: as Argentina defines 833 as services incidental to mining, 833 may be a typographical error.</i>)	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Australia	CPC 883 - Consultancy on a fee or contract basis relating to mining and oil field development.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 86752, 86753 - Assembly and assessment of land and geographic related information; practice of the science of measurement; use of that information for the purpose of planning and implementing the administration of the land and sea. May involve surveying activities on, above or below the surface of the land or sea.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Bulgaria	CPC 883 (part of) - Services on a contract basis for repair and dismantling of equipment in oil and gas fields.	1- Unbound due to a lack of technical feasibility. 2 - None 3 - Unbound	1 - Unbound due to a lack of technical feasibility. 2 - None 3 - Unbound
	CPC 8676 (part of) - Technical testing and analysis services, except for services related to the issuance of official certificates and similar documents.	1-Unbound 2-None 3-Unbound	1-Unbound 2-None 3-Unbound

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Canada	CPC 883	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675 CPC 86751 - Geological, geophysical and other scientific prospecting services, including those related to mining. CPC 86752 - Subsurface surveying services. CPC 86753 - Surface surveying services CPC 86754 - Map making services.	1 - None, other than provincial reservations. 2 - None, other than provincial reservations. 3 - None, other than for land surveyors a commercial presence must take the form of a sole proprietorship or partnership, except in Alberta where it may take the form of a surveyor's corporation and provincial reservations. 4 - Unbound, except as indicated in the horizontal section, and in provincial reservations.	1 - None, other than for mineral and petroleum exploration and development - Federal and subnational tax measures that result in a difference of treatment for expenditures incurred in connection with services performed in Canada related to the exploration and development of a mineral resource, petroleum or natural gas; and provincial reservations. 2 - None other than for mineral and petroleum exploration and development - Federal and subnational tax measures that result in a difference of treatment for expenditures incurred in connection with services performed in Canada related to the exploration and development of a mineral resource, petroleum or natural gas; and provincial reservations. 3 - None, other than provincial reservations. 4 - Unbound, except as indicated in the horizontal section, and in provincial reservations.
	CPC 8676	1-None 2-None 3-None	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Canada-British Columbia	CPC 8675 CPC 86751 - Geological, geophysical and other scientific prospecting services, including those related to mining. CPC 86752 - Subsurface surveying services. CPC 86753 - Surface surveying services. CPC 86754 - Map making services.	1 - Free miner applicants must ordinarily be a Canadian citizen and a permanent resident of Canada, a Canadian corporation or a partnership of the foregoing. 2-None, except federal level reservations 3-None, except federal level reservations 4-None, except federal level reservations, and free miner applicants must be a permanent resident.	1 - None, other than federal level reservations and a residency requirement for applied science technologist/technicians and land surveyors. 2 - None other federal level reservations and a residency requirement for accreditation of land surveyors. 3 - None, except federal level reservations. 4 - None, except federal level reservations and a residency requirement for accreditation of applied science technologist/technicians and land surveyors.
Canada - Manitoba	CPC 8675 CPC 86751 - Geological, geophysical and other scientific prospecting services, including those related to mining. CPC 86752 - Subsurface surveying services. CPC 86753 - Surface surveying services. CPC 86754 - Map making services.	1 - Manitoba maintains a citizenship requirement for accreditation of land surveyors. 2 - Manitoba maintains a citizenship requirement for accreditation of land surveyors. 3- None, except federal level reservations. 4 - Manitoba maintains a citizenship requirement for accreditation of land surveyors.	1 - None, except federal level reservations. 2 - None, except federal level reservations. 3 - None, except federal level reservations. 4 - None, except federal level reservations.
Canada - Newfoundland	CPC 8675 CPC 86751 - Geological, geophysical and other scientific prospecting services, including those related to mining. CPC 86752 - Subsurface surveying services. CPC 86753 - Surface surveying services. CPC 86754 - Map making services.	1 - Newfoundland maintains a permanent residency requirement for accreditation of land surveyors. 2- Newfoundland maintains a citizenship requirement for accreditation of land surveyors. 3-None, except federal level reservations. 4 - Newfoundland maintains a permanent residency requirement for accreditation of land surveyors.	1 - Newfoundland maintains a residency requirement for accreditation of geoscientists. 2 - None, except federal level reservations. 3 - None, except federal level reservations. 4 - Newfoundland maintains a residency requirement for accreditation of geoscientists.

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Canada - Nova Scotia	CPC 8675 CPC 86751 - Geological, geophysical and other scientific prospecting services, including those related to mining. CPC 86752 - Subsurface surveying services. CPC 86753 - Surface surveying services. CPC 86754 - Map making services.	1- Citizenship is required for accreditation of land surveyors. 2 - Citizenship is required for accreditation of land surveyors. 3 - None, except federal level reservations. 4 - None, except federal level reservations.	1 - None, except federal level reservations. 2 - None, except federal level reservations. 3 - None, except federal level reservations. 4 - None, except federal level reservations.
Canada - Ontario	CPC 8675 CPC 86751 - Geological, geophysical and other scientific prospecting services, including those related to mining. CPC 86752 - Subsurface surveying services. CPC 86753 - Surface surveying services. CPC 86754 - Map making services.	1 - None, except for federal level reservations. 2- Training must be completed in Ontario for accreditation of land surveyors. 3 - None, except federal level reservations. 4 - None, except federal level reservations.	1 - Ontario maintains a residency requirement for accreditation of cadastral surveying. Ontario maintains a residency requirement for accreditation of land surveyors. Training must be completed in that province for accreditation. 2- Ontario maintains a residency requirement for accreditation of land surveyors. Training must be completed in that province for accreditation. 3 - For cadastral surveying services, 70 percent or more of shares must be owned by Canadians. 4 - Ontario maintains a residency requirement for accreditation of cadastral surveying. Ontario maintains a residency requirement for accreditation of land surveyors.
Canada - Quebec	CPC 8675 CPC 86751 - Geological, geophysical and other scientific prospecting services, including those related to mining. CPC 86752 - Subsurface surveying services. CPC 86753 - Surface surveying services. CPC 86754 - Map making services.	1 - Quebec maintains a citizenship requirement for accreditation of land surveyors, subsurface surveying services, professional technologists, and chemists. 2 - Quebec maintains a citizenship requirement for accreditation of land surveyors and subsurface surveying services. 3 - None, except for federal level reservations. 4 - Quebec maintains a citizenship requirement for accreditation of land surveyors, subsurface surveying services, and chemists. Citizenship is required for use of the title, "Professional Technologist."	1 - None, except federal level reservations. 2 - None, except federal level reservations. 3 - None, except federal level reservations. 4 - None, except federal level reservations.

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Canada - Saskatchewan	CPC 8675 CPC 86751 - Geological, geophysical and other scientific prospecting services, including those related to mining. CPC 86752 - Subsurface surveying services. CPC 86753 - Surface surveying services. CPC 86754 - Map making services.	1 - Saskatchewan maintains a commercial presence requirement for accreditation of land surveyors. 2 - Saskatchewan maintains a commercial presence requirement for accreditation of land surveyors. 3 - None, except federal level reservations. 4 - None, except federal level reservations.	1 - None, except federal level reservations. 2 - None, except federal level reservations. 3 - None, except federal level reservations. 4 - None, except federal level reservations.
China	CPC 8675	1 - None 2 - None 3 - Only in the form of petroleum exploitation in cooperation with Chinese partners.	1 - None 2 - None 3 - None
	CPC 86751 - Offshore oilfield services geological, geophysical and other scientific prospecting services	1 - None 2 - None 3 - Only in the form of petroleum exploitation in cooperation with Chinese partners.	1 - None 2 - None 3 - None
	CPC 86752 - Subsurface surveying services	1 - None 2 - None 3 - Only in the form of petroleum exploitation in cooperation with Chinese partners.	1 - None 2 - None 3 - None
	CPC 8676 and freight inspection covered by CPC 749, excluding statutory inspection services for freight inspection services	1 - None 2 - None 3 - Foreign services suppliers which have been engaged in inspection services in their home countries for more than three years are permitted to establish joint venture technical testing, analysis and freight inspection companies with no less than US\$ 350,000 in registered capital. Within two years after China's accession, foreign majority ownership will be permitted and within four years after China's accession, wholly foreign-owned subsidiaries will be permitted.	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
China– <i>continued</i>	Onshore oilfield services (No CPC listed)	<p>1 - None 2 - None 3 - Only in the form of petroleum exploitation in cooperation with China National Petroleum Corp. (CNPC) in the designated areas approved by the Chinese government. In order to carry out the petroleum contract, the foreign service supplier shall establish a branch, subsidiary or representative office within the territory of the People's Republic of China and go through registration formalities in accordance with the laws. The domiciles of the said offices shall be determined through consultation with CNPC. The foreign service supplier shall open its bank account with a bank approved by the Chinese authorities to engage in foreign exchange business within the Chinese territory.</p>	<p>1 - None 2 - None 3 - The foreign service supplier shall furnish CNPC accurately and promptly with the reports on the petroleum operations, and shall submit to CNPC the data and samples as well as various technological, economic, accounting and administrative reports related to petroleum operations. CNPC shall have the ownership of all of the data records, samples, vouchers and other original information acquired during the implementation of the petroleum operations. The investment of foreign service suppliers shall be made in US dollars or other hard currencies.</p>
Côte d'Ivoire	CPC 8676 - Technical testing and analysis services as it applies to activities in the following sectors: prospecting, mining or processing of minerals; storage and market preparation of food and agricultural products; and manufacturing activities for the processing of local raw materials.	<p>1 - Unbound 2 - Unbound 3 - None 4 - Unbound, except for measures affecting the entry and temporary stay of natural persons who are employees of a company and transferred to a company incorporated in Cote d'Ivoire belonging to, controlled by or a subsidiary of the former in the following categories: managers, senior executives, and specialists who possess knowledge that is essential to the provision of the service</p>	<p>1 - Unbound 2 - Unbound 3 - Enterprises must receive government approval. The criteria that must be met in order to obtain approval may include: the preferential use of local services to the extent that they are available under conditions of quality, price and delivery equivalent to those of like products of foreign origin; and the employment and training of local executives and supervisors.</p>

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Croatia	CPC 8675	1 - None, except that services of basic geological, geodetic and mining research as well as related environmental protection research services on the territory of Croatia can be carried out only jointly with/or through domestic legal persons. 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676 - Technical testing and analysis services, excluding services related to issuance of mandatory certificates and similar official documents.	1 - Institutions should be registered in the international accreditation system 2 - None 3 - None	1 - None 2 - None 3 - None
Czech Republic	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Dominican Republic	CPC 883	1–None 2–Unbound 3–None	1–Unbound 2–Unbound 3–Unbound
	CPC 8675	1–None 2–Unbound 3–None	1–None 2–Unbound 3–Unbound
	CPC 8676	1–None 2–Unbound 3–None	1–None 2–Unbound 3–Unbound
Ecuador	CPC 833 (<i>Note: as Ecuador defines 833 as services incidental to mining, 833 may be a typographical error.</i>)	1–Unbound 2–None 3–None	1–Unbound 2–None 3–None
	CPC 8675 - Study and evaluation of hydrocarbon deposits; production analysis control; and improved recovery of hydrocarbons.	1–Unbound 2–None 3–None	1–Unbound 2–None 3–None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Estonia	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
European Union—all members	CPC 883 - Advisory and consulting services relating to mining	1 - None 2 - None 3 - None, except for country specific limitations.	1 - None 2 - None 3 - None 4 - Unbound, except as indicated in the horizontal section and subject to country-specific limitations.
	CPC 8675, excludes the operation of mines.	1 - Unbound for exploration services. 2 - None 3 - None, except for country specific limitations. 4 - Unbound, except as indicated in the horizontal section and subject to country-specific limitations.	1 - Unbound for exploration services. 2 - None 3 - None, except for country specific limitations. 4 - Unbound, except as indicated in the horizontal section and subject to country-specific limitations.
	CPC 8676	1 - None, except for country specific limitations. 2 - None 3 - None, except for country specific limitations. 4 - Unbound, except as indicated in the horizontal section under (iii) and subject to country-specific limitations.	1 - None, except for country specific limitations. 2 - None 3 - None
European Union - Denmark ³	CPC 8676	1 - None 2 - None 3 - None 4 - University degree or technical qualifications demonstrating knowledge and three years' professional experience are required.	1 - None 2 - None 3 - None
European Union-Finland ³	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
European Union-Finland ³ - <i>continued</i>	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
European Union - France ³	CPC 8675, excluding the operation of mines.	1 - Unbound for exploration services. 2 - None 3 - For surveying services, access through a SEL (anonyme, à responsabilité limitée ou en commandite par actions), SCP, SA and SARL only. 4 - Unbound, except as indicated in the horizontal section and subject to the following limitation: surveying operations relating to the establishment of property rights and to land law are reserved for EC "experts-géomètres".	1 - Unbound for exploration services. 2 - None 3 - Exploration and prospecting services are subject to authorization.
European Union - Germany ³	CPC 8675, excluding the operation of mines.	1 - Unbound for exploration services. 2 - None 3 - None 4 - Unbound, except as indicated in the horizontal section and subject to conditions of nationality for publicly- appointed surveyors.	1 - Unbound for exploration services. National rules on fees and payments apply to all surveying services which are performed from abroad. 2 - None 3 - None, except for country specific limitations.
	CPC 8676	1 - None 2 - None 3 - None, except for country specific limitations. 4 - University degree or technical qualifications demonstrating knowledge and three years' professional experience are required.	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
European Union - Italy ³	CPC 8675, excluding the operation of mines.	1 - Unbound for exploration services. 2 - None 3 - For certain exploration services activities related to mining (minerals, oil, gas, etc.), exclusive rights may exist. Only natural persons can work as surveyors and geologists. Professional association (no incorporation) among natural persons permitted.	1 - Unbound for exploration services. 2 - None 3 - None, except for country specific limitations. 4 - Unbound, except as indicated in the horizontal section and subject to a residency requirement.
	CPC 8676	1 - Unbound for the profession of biologist and chemical analyst. 2 - None 3 - Only natural persons can work as biologists and chemical analysts. Professional association (no incorporation) among natural persons is permitted.	1 - Unbound for the profession of biologist and chemical analyst. 2 - None 3 - None
European Union - Portugal ³	CPC 883 - Advisory and consulting services relating to mining	1 - None 2 - None 3 - Access for mining engineers is restricted to natural persons.	1 - None 2 - None 3 - None 4 - Unbound, except as indicated in the horizontal section. Residency is required.
	CPC 8675, excluding the operation of mines.	1 - Unbound for exploration services. 2 - None 3 - Access restricted to natural persons.	1 - Unbound for exploration services. 2 - None 3 - None, except for country specific limitations. 4 - Unbound, except as indicated in the horizontal section and subject to a residency requirement.
European Union - Spain ³	CPC 883 - Advisory and consulting services relating to mining	1 - None 2 - None 3 - Only natural persons can work as mining engineers.	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
European Union - Spain ³ - <i>continued</i>	CPC 8675, excluding the operation of mines.	1 - Unbound for exploration services. 2 - None 3 - Only natural persons can work as surveyors and geologists.	1 - Unbound for exploration services. 2 - None 3 - None, except for country specific limitations.
	CPC 8676	1 - None 2 - None 3 - Only natural persons can work as biologists and chemical analysts.	1 - None 2 - None 3 - None
European Union - Sweden ³	CPC 883 - Advisory and consulting services relating to mining	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None 4 - University degree or technical qualifications demonstrating knowledge and three years' professional experience are required.	1 - None, except for country specific limitations. 2 - None 3 - None
European Union - United Kingdom ³	CPC 8676	1 - None 2 - None 3 - None 4 - University degree or technical qualifications demonstrating knowledge and three years' professional experience. Compliance with an economic needs test is required.	1 - None, except for country specific limitations. 2 - None 3 - None
Georgia	CPC 883	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Georgia- <i>continued</i>	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Hungary	CPC 883	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Iceland	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
India	CPC 8676	1 - Unbound 2 - Unbound 3 - Only through incorporation with a foreign equity ceiling of 51 percent.	1 - Unbound 2 - Unbound 3 - None
Indonesia	CPC 8676	1 - Unbound for government funded projects. 2 - Unbound for government funded projects. 3 - Joint operation through a representative office in Indonesia.	1 - Unbound 2 - Unbound 3 - The Indonesian participant in the joint operation must be member of the Indonesian Consultants Association.
Israel	CPC 883 - Services incidental to mining and oil-field services.	1 - Unbound due to a lack of technical feasibility. 2 - Unbound due to a lack of technical feasibility. 3 - None	1 - Unbound due to a lack of technical feasibility. 2 - Unbound due to a lack of technical feasibility. 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Israel- <i>continued</i>	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Japan	CPC 86751, CPC 86752 - Related scientific and technical consulting services (excluding services related to petroleum, petroleum products, gas, mineral, and surveying).	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None except as indicated in horizontal commitments
	CPC 86753, CPC 86754 - Surveying services for the land in Japan.	1 - Commercial presence is required except for the surveying conducted by not using Basic Survey data or Public Survey data, and the surveying for small areas or the surveying not requiring high accuracy. 2 - Commercial presence is required except for the surveying conducted by not using Basic Survey data or Public Survey data, and the surveying for small areas or the surveying not requiring high accuracy. 3 - None	1 - None 2 - None 3 - None except as indicated in horizontal commitments
Jordan	CPC 8675, excluding prospecting, surveying, exploration, exploitation and map making.	1 - Unbound 2 - None 3 - Subject to a 50-percent foreign equity limitation. Cabinet authorization is required. Geologists/geological engineers must be Jordanian nationals. 4 - Unbound, except as indicated in the horizontal section. Geologist/geological engineers must be Jordanian nationals.	1 - Unbound. 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None, except geo-technical testing services are subject to 50 percent foreign equity limitation.	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Korea	CPC 883 - Consulting services related to mining.	1 - Unbound 2 - Unbound 3 - None	1 - None 2 - None 3 - None
	CPCs 86751 and 86752 - Related scientific and technical consulting services.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 86761/2 - Composition and purity testing and analysis services. (Only inspection, testing and analysis services of air water, noise level and vibration lever under CPC 86761)	1 - None 2 - None 3 - Establishment of a commercial presence is subject to an economic needs test.	1 - None 2 - None 3 - None
	CPC 86764 - Technical inspection services.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Kuwait	CPC 8676	1 - Unbound 2 - Unbound 3 - None	1 - Unbound 2 - Unbound 3 - None
Kyrgyz Republic	CPC 883, 5115 - Services incidental to mining	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Latvia	CPC 883	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Lesotho	CPC 883	1 - Unbound 2 - Unbound 3 - Unbound	1 - Unbound 2 - Unbound 3 - Unbound
	CPC 8675 - Engineering-related scientific and technical consulting services.	1 - Unbound 2 - Unbound 3 - Unbound	1 - Unbound 2 - Unbound 3 - Unbound
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Liechtenstein	CPC 883, excluding prospecting, surveying, exploration, and exploitation.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675, excluding prospecting, surveying, exploration, and exploitation.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Lithuania	8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Madagascar	CPC 8676 (part of) Research, analysis and control of basic equipment in the following sectors: preparation of products of vegetable origin; logging and industrial reforestation; storage and packaging of food products.	1 - Unbound 2 - None 3 - Enterprises must obtain approval from the authorities concerned and comply with the performance requirements set forth in the approval document in accordance with the stipulated criteria, including the number of local jobs created and the national value-added criterion.	1 - Unbound 2 - None 3 - None
Malawi	CPCs 883 and 5115 - Services incidental to mining, exploration.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Malaysia	CPC 8676, except CPC 86764	1 - None 2 - None 3 - Only through a locally incorporated joint venture with Malaysian individuals or Malaysian-controlled corporations or both. Bumiputera shareholding in the joint venture must be at least 30 percent.	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Moldova	CPCs 883 and 5115 - Services incidental to mining	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Mongolia	CPCs 883 and 5115 - Services incidental to mining.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Namibia	CPC 86751 - Related scientific and technical consulting services: offshore oil and gas exploration.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Nicaragua	CPC 883 and CPC 5115 - Services incidental to mining.	1 - None 2 - Unbound 3 - None	1 - None 2 - Unbound 3 - None
Norway	CPC 8675 (part of) - Related scientific and technical consulting services (concerned parts of CPC 8675 not relating to offshore activities).	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Oman	CPC 8675	1 - None 2 - None 3 - Foreign equity limited to 51 percent.	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - Foreign equity is limited to 51 percent.	1 - None 2 - None 3 - None
Pakistan	CPC 883 and CPC 5115 - Services incidental to mining.	1 - Unbound 2 - Unbound due to lack of technical feasibility. 3 - None	1 - Unbound 2 - Unbound due to lack of technical feasibility. 3 - None
	CPC 8676	1 - Unbound due to lack of technical feasibility. 2 - None 3 - None	1 - Unbound due to lack of technical feasibility. 2 - None 3 - None
Panama	CPC 883	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 86751- Related scientific and technological consultancy–geological, geophysical and other scientific prospecting services. CPC 86752 - Related scientific and technological consultancy–underground topography services. CPC 86753 is defined by Panama as related scientific and technological consultancy–surface topography services.	1 - Unbound 2 - None 3 - None, but engineers have to be licensed in Panama.	1 - Unbound 2 - None 3 - None, but engineers have to be licensed in Panama.
Poland	CPC 883 - Services incidental to mining, excluding exploitation of natural resources.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Qatar	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None, except as indicated under the horizontal section.

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Singapore	Professional, advisory and consulting services relating to agriculture, forestry, fishery, and mining, including oilfield services (no CPC identified).	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Slovak Republic	CPC 8675	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Slovenia	CPC 8676 - Technical testing and analysis services (a public utility exists; concession rights can be granted to the private operators established in the Republic of Slovenia).	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
South Africa	CPC 883	1 - Unbound 2 - Unbound 3 - None	1 - Unbound 2 - Unbound 3 - None
	CPC 8675 - Engineering related scientific and technical consulting services.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Swaziland	CPCs 86761 to 86769 - Technical testing and analysis services.	1 - Unbound 2 - None 3 - None	1 - None 2 - None 3 - None
Switzerland	CPC 883 (part of) and CPC 5115 (part of) are defined by Switzerland as services incidental to mining, excluding prospecting, surveying, exploration and exploitation.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675 (part of) - Related scientific and technical consulting services, excluding prospecting, surveying, exploration and exploitation.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Switzerland– <i>continued</i>	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
Thailand	CPC 883 - Services performed at oil and gas fields only.	1 - Unbound 2 - None 3 - None other than that indicated in the horizontal section.	1 - Unbound 2 - None 3 - No limitations as long as foreign equity participation does not exceed 49 percent.
	CPC 86761 and 86769 - Technical testing and analysis services.	1 - Unbound 2 - None 3 - None other than that indicated in the horizontal section.	1 - Unbound 2 - None 3 - No limitations as long as foreign equity participation does not exceed 49 percent.
Turkey	CPC 883, CPC 5115	1 - Establishment is required. 2 - None 3 - None. The Petroleum and Mining Law specify's that services incidental to mining require an operating license.	1 - Nationality is required for real persons 2 - None 3 - None
United Arab Emirates	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None, except as indicated in the horizontal section
United States	CPC 883 - Services incidental to mining	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8675 - Related scientific and technical consulting services (except land surveying for the purpose of establishing legal boundaries, aerial surveying and aerial map-making)	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None (However, for those functions where an engineering degree is required, U.S. limitations on engineering services also apply.)
Venezuela	CPCs 8675, 883, 5115 - services incidental to mining.	1 - Unbound 2 - None 3 - None	1 - Unbound 2 - None 3 - None

Appendix C
GATS Commitments on Oil and Gas Field Services by Country

Country	CPC code ¹	Market access ²	National treatment ²
Zambia	CPC 883 and CPC 5115 - services incidental to mining, exploration.	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None
	CPC 8676	1 - None 2 - None 3 - None	1 - None 2 - None 3 - None

¹ For the purposes of this study, the CPCs that affect oil and gas field services include 8675, generally defined as related scientific and technical consulting services; 8676, generally defined as technical testing and analysis services; and 883, services incidental to mining. Some countries identify services incidental to mining under both CPC 883 and CPC 5115. CPC 5115 is defined as site preparation work for mining. Different interpretations of these CPCs are noted.

² Mode 1 - cross-border supply, Mode 2 - consumption abroad, Mode 3 - commercial presence, Mode 4 - presence of natural persons. Mode 4 is not included because countries tend to list it as unbound, except where noted otherwise in the horizontal commitments. However, where countries have additional restrictions on Mode 4, these are noted in the table.

³ See also EU-wide restrictions.

Source: Compiled by the U.S. International Trade Commission.

APPENDIX D
ENERGY SERVICES COALITION
MEMBERSHIP LIST

Members of the Energy Services Coalition

ABB
American Consulting Engineers Council
American Petroleum Institute
American Wind Energy Association
Baker Hughes, Inc.
BCIU
BP America Inc.
Business Council for Sustainable Energy
CG/LA Infrastructure
Capitol Strategies
ChevronTexaco
CMS Energy
Coalition of Service Industries (CSI)
ConocoPhillips
Domestic Petroleum Council
Duke Energy
Edison Electric Institute
EDS
EPRI
Electric Power Supply Association (EPSA)
El Paso Energy
Emerson Electric Co.
Energy Associates
Entergy Wholesale
Environmental Export Council
European American Business Council (EABC)
Export Council for Energy Efficiency
ExxonMobil Corp.
EZ Solutions, Inc.
General Electric
Halliburton Company
Honeywell
International Association of Drilling Contractors (IADC)
Interstate Natural Gas Association of America (INGAA)
Independent Petroleum Association of America (IPAA)
Kelley Drye & Warren
Key Energy Services Inc.
KW International
Marathon Oil
McDermott Inc.
Mid-American Energy Holdings Company
National Association of Energy Services Companies (NAESCO)
National Foreign Trade Council (NFTC)
National Electrical Manufacturers Association (NEMA)

New York Mercantile Exchange
NRG Energy, Inc.
Petroleum Equipment Suppliers Association (PESA)
Pride International
RiskAdvisory
Rockwell Automation
Sarkeys Energy Center, University of Oklahoma
Schlumberger Technology
United States Energy Association (USEA)
US ASEAN Business Council
US Chamber of Commerce
United States Council for International Business (USCIB)
University of Houston Energy Institute
University of Texas at Austin Bureau of Economic Geology
U.S. Oil & Gas Association
US Pacific Economic Cooperation Council (US-PECC)
World Environment Center